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ABSTRACT

Noting the high unemployment and the need for increased education for employment among the peoples of Europe, the European Round Table of Industrialists conducted a study to identify the main problems related to European education and training from industry's point of view. The study's goal was to draw up practical recommendations for educational administrators, institutions, and industry on how education in Europe could be improved to keep pace with the constantly changing competitive environment. The working group organized into subcommittees and task forces concentrating on basic education, higher education, vocational education and training, management training, and lifelong learning and adult education. The group reviewed research studies, surveyed European companies, and interviewed administrators to gather data. As a result of the research, the working group identified the following issues and made recommendations: the revitalization of basic education, cooperation between industry and educational institutions, the importance of technical and professional education, compatibility and cooperation in education, and the importance of lifelong learning and adult education. A matrix for implementing the recommendations was constructed, matching the issues to tasks to be carried out by industry, educational institutions, educational authorities, government, and international organizations. (Definitions of terms and 43 references accompany the document.) (KC)

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EDUCATION AND EUROPEAN COMPETENCE

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Education and European Competence

ERT Study on Education and Training in Europe

February 1989

Study and Acknowledgements

The ERT Standing Working Group on Education consists of the following organisation and four subcommittees.

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Several prestigious organisations, including the European Institute of Education and Social Policy in Paris, The Prospect Centre in Surrey, the European Foundation for Management Development (EFMD) in Brussels and the Fédération Européenne des Associations Nationales d'Ingénieurs (FEANI) in Paris were consulted and have given their contributions. We also received advice and support from several education experts within the European Community, the OECD and the Standing Conference of Rectors, Presidents and Vice-Chancellors of European Universities (CRE) in Geneva.

Major contributions were received from Dr Andris Barblan and Mr Horst Lemke; and general adviser to the Working Group was Prof.Dr Matti Otala.

Co-ordinator for the Working Group was Dr Jan-Peter Paul.

The Working Group acknowledges the Chairmanship of Dr Kari Kairamo, who passed away in 1988. His leadership brought this report together in a major way.

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Companies that participated in the Survey

Anova AG, Switzerland
Asea AB, Sweden
B.A.T Industries plc, United Kingdom
Daimler-Benz AG, West Germany
Fiat SpA, Italy
Lafarge Coppée, France
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Nokia, Finland
Norsk Hydro AS, Norway
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Pirelli SpA, Italy
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Robert Bosch GmbH, West Germany
Siemens AG, West Germany
Saint Gobain, France
Société Générale de Belgique, Belgium
Telefónica de España SA, Spain
Thomson SA, France
Volkswagen AG, West Germany
AB Volvo, Sweden
Waterford Glass plc, Ireland

Foreword

European industry, as well as the cost structure of its products, has become more knowledge-intensive. Therefore a competitive advantage can be gained by raising employees' level of education and thus their competence. Skilled and well-educated people are vital for success. That was the principal reason why the **European Round Table of Industrialists** concluded that education is a strategic issue in European competitiveness.

The causes of the high unemployment rate in Europe, as documented in the Round Table publication "Making Europe Work" (1986), indicate that much of the increase in unemployment is caused by inappropriate or outdated education. At the same time, Europe lacks skilled labour in many professions and industries. Clearly, supply does not match demand in European education.

Europe allows and even encourages its young individuals to take the liberty of pursuing "interesting", not directly job-related, studies which in many cases have little prospect of practical application. At the same time, society is expected to provide full employment for everybody. This unbalanced situation is not eased by the fact that, in some countries, quotas for certain professions are maintained regardless of the law of supply and demand.

The question to be asked is: Does our educational system properly prepare people to live and work in Europe in the 21st century, and does it provide people with adequate new knowledge throughout their working life? The technical and industrial development of European industry clearly requires an accelerated revitalisation of education and its curricula. It also requires new opportunities and new models for updating and upgrading the skills and competence of Europe's working-age population.

The demography of the European workforce is changing and the working population is aging rapidly. The decline in student enrolments at professional schools and universities will be rather dramatic between 1990 and 2000. It is not unreasonable to suggest that the technological leadership of the West will be threatened if that happened. A report issued in West Germany warns that high-technology sectors of industry are already under pressure and raises the question of whether European scientists and engineers will be able to cope with international competition when they are, on average, 10 to 20 years older than their Asian competitors.

The likely consequence is that a lot of economic, political and technological assets will be transferred to Asian countries with rapidly growing populations. Multinationals are likely to gravitate toward these rapidly expanding markets. One of the most important alternatives available to Europe is to discover ways of using the talents of older workers by means of refresher studies, retraining them and upgrading their competence. Learning should be a part of daily life and work. **Lifelong learning** should be adopted by modern Europe.

The countries within the European Economic Space are undergoing a rapid process of economic integration. However, arrangements for updating education and training have not been adequately envisaged, although the EC has begun this challenging work. Within EFTA and between the EC and EFTA, such efforts are practically non-existent. Education and training are still considered by many governments and decision makers as national matters and the new need to make various national systems compatible as a means of integrating Europe is still being ignored.

To address these issues, the European Round Table of Industrialists established in 1987 a **Standing Working Group on Education** and asked it to identify the main problems related to European education and training from industry's point of view. The Group's goal was to draw up practical recommendations for education administrations, institutions and industry itself on how education in Europe could be improved and adjusted to keep pace with a constantly changing competitive environment.

The Working Group organised itself into four subcommittees, concentrating on the following aspects:

- Basic Education
- Higher Education
- Vocational Education and Training
- Management Training

Each subcommittee conducted a study and compiled a report, using the expertise within the ERT as well as that of external specialists. In addition, a special task force studied the question of **Lifelong Learning** and **Adult Education**.

The Working Group also carried out an industry survey to assess the opinions and expectations of ERT-related companies. A further goal was to determine how companies in Europe educate and train their own personnel. The findings of the subcommittees and the results of the industry survey have been compiled in the book "Education for Life: A European Strategy".

Several companies, institutions and individuals contributed to the work. Members of the ERT Standing Working Group on Education, and all the subcommittee members and chairmen, have shown considerable interest and devoted much time to analysing the questions and preparing the report.

The dedication of those who participated has made it possible to complete the study regardless of the fact that the resources available to the ERT and outside experts were modest in view of the extremely wide and complicated range of questions to be dealt with.

As far as is known, this study – both the review work, in which the four subcommittees studied various education levels in Europe, and the industry survey – is the first investigation into education on a Europe-wide basis. It has provided new information and also stimulated new conclusions and proposals. The need for faster renewal of European education and for greater educational compatibility has become quite clear. Similarly, the necessity of creating a European concept of lifelong learning and the need for closer cooperation and partnership between all parties concerned with education and training has been identified.

Execution of this Study

This summary is compiled from four subcommittee reports (Basic Education, Higher Education, Vocational Education and Training, Management Training) and the survey conducted among ERT companies. It further includes inputs from a multiplicity of documents and surveys in the field of European education:

- Research reports from a large number of education experts representing various nations and faculties
- Documents, proposals and deliberations by politicians and government officials concerning education
- Ideas and proposals of education and training experts within industry
- Present educational activities of the companies, and future expectations expressed by them.

In 1987–1988, the ERT conducted a survey of the education and training work being done by major European companies. The survey elicited opinions and conceptions concerning public education. Some 24 major companies from 13 EC and EFTA countries participated.

Structured interviews were conducted, usually at corporate headquarters, with individuals responsible for human resource development or education and training within the company. The interviews were complemented by published material, such as company educational policies and education manuals.

Once all the interviews had been completed, they were compiled in a databank and analysed. For the survey, the Round Table commissioned European specialists in various fields of education who have, together with the Working Group, analysed the material gathered.

The problems of education in Europe vary from country to country. It is difficult to generalise: some issues which are major problems at a certain level of education in one country do not exist or are relatively minor in another. Therefore, the applicability of the following recommendations must be assessed separately for each geographical area, and general flexibility will have to be a major feature of all solutions attempted.

Education is recognised to be assuming growing importance for the well-being of modern society. Consequently, it is being discussed and studied more actively by several organisations, both worldwide and in Europe, than in the recent past. The EC and the OECD have conducted and are conducting various studies and reports concerning the new requirements for education.

The work of the Commission is warmly supported by industry. The Commission and the Council of European Ministers have discussed the transferability and compatibility of vocational and other professional degrees. European educational programmes such as ERASMUS, COMETT and YES have been put into effective use in the distribution and transfer of knowledge and education resources throughout Europe. Confederations of both industry and labour in Europe are also paying increased attention to education. The Confederation of British Industries (CBI) has recently issued a report urging more links between schools and industry. These activities are extremely important and eminently supportable.

Courtesy of Bosch

Issues and Recommendations

Revitalisation of Basic Education

Education in Europe is fundamentally sound and its academic quality is good. However, administrative practices are often too rigid to allow educational institutions at various levels to adapt to the changes made imperative by rapidly developing modern technology and the restructuring of industry and services. So far, these developments have not been taken adequately into consideration in creating new methods and curricula for European education.

Of particular concern are the **quality, skills and competence of teachers**. At present, no systematic policies exist for modernising the teacher training curricula, nor for retraining teachers. Teachers have few opportunities for career development and, most often, no experience in other professions. Additionally, the results of their work are difficult to measure and assess.

Young people today learn principally by visual experience. Since the need for individualised education is growing rapidly at the same time as knowledge is fast becoming obsolete, new means of supplying appropriate basic education are obviously essential. These include **new tools and methods** such as computer-aided in-

Courtesy of Olivetti

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struction, satellite programmes and other means.

Co-operation between the European media industry and educational institutions should be increased to develop more TV and video material covering a wide range of curricula and available in the major European languages for use within the European Economic Space.

Mathematics and the sciences form the basis of all technology. Thus they should play an adequate role in school curricula. Somehow these subjects are failing to attract young students. European school authorities could perform a valuable service by formulating a plan to revitalise the teaching and curricula of mathematics, physics, chemistry and natural sciences, and also determine minimum qualifications and requirements. It is in industry's interest to participate in and sponsor this work.

- Basic educational programmes are too rigid
- Basic education and working life are too far apart
- Education has not adapted to changes in technology and the restructuring of work
- A stronger concentration on mathematics, physics and new technology is needed
- New educational tools have had little acceptance
- TV and other media could co-operate more with educational institutions to provide teaching material
- Skills and competence of teachers need better updating
- Student exchange programmes are in need of development

Co-operation between Industry and Educational Institutions

In contrast with the United States, co-operation between industry and educational institutions has traditionally been relatively weak in Europe. This is especially true of academic studies and research. Also, industry's influence on the curricula being developed has been weak, and this has adversely affected the real working skills of students entering employment after graduation.

Several methods can be employed to improve co-operation:

- Industry support for major EC and other European educational programmes, such as COMETT and Euro-PACE, deserves encouragement in order to strengthen and widen the scope of adult education in industry.
- Development of partnerships between universities/colleges and industry within programmes for post-graduates and undergraduates and in vocational training courses is necessary. Several models reflecting this concept emerged from the survey. However, most of these were local or regional in character. Programmes like NORIT, U-LINK and TARGET (a COMETT programme successfully implemented in the UK) provide good starting points for further expansion and development on a multilateral basis. Some companies have initiated models for industry/university co-operation. The development and enhancement of these models on a wider basis, not only at the level of higher education but also within vocational education and training, could be encouraged.
- To improve the continuous interaction between industry and education, it is recommended that the administrative bodies of schools and universities admit greater representation on the part of companies, which could also participate in the development of the curricula and other teaching tools.

Courtesy of Fiat

- To improve the awareness of teachers on all levels about economics and industry, a special training programme for school teachers could be regularly organised by industry and chambers of commerce. Training programmes for vocational school and university teachers could also be organised by different companies.

In order to make university and college education more related to the world of work, it is desirable that teachers and professors should have working experience in industry. Opportunities to organise various apprenticeship programmes for teachers warrant study.

Industry could also contribute by encouraging its own personnel to act as part-time teachers. More, and also international, apprenticeships and schemes combining school and work-based learning are recommended, to provide young people with the opportunity to have a basic facility for a vocation. Apprenticeship in industry could be an obligatory part of all secondary education. Educational advisors to the British government have recommended that work experience be given to all pupils before they leave school.

To enhance co-operation between companies in the field of education and training, and broaden models for company-university co-operation, a forum of education and training managers of European industry could be considered. The education and training directors and managers of certain companies that participated in the survey had, in 1987, organised a meeting to discuss their educational and training activities and experiences. These meetings have continued.

- Co-operation between industry and educational institutions in Europe lags behind the United States and Japan
- Industry's influence on curricula and qualifications is too weak
- Local and regional industry-university co-operation programmes could be expanded
- More industry involvement in EC and other European educational programmes is desirable
- More industry representation on the administrative bodies of schools and universities is recommended
- Apprenticeships and training programmes for teachers in industry
- Encourage company employees to act as part-time teachers
- More – also international – apprenticeship schemes at all levels of education are needed

Importance of Technical and Professional Education

There is a positive correlation between technical competence and business success. The importance of technology is not, however, reflected in the educational priorities of Europe:

- there are only 39 new students per annum in technology per 100,000 inhabitants in Europe, while the figures for the United States and Japan are 77 and 76 respectively
- there is a chronic shortage of engineers in many new areas of technology
- companies' training activities are concentrated on management and general issues and based on short-term ad hoc courses. Effective, long-term, targeted studies in major fields of modern technology for personnel and working adults are still rare in Europe
- at the level of higher education, technical studies do not attract students as much as, for example, the humanities.

Technology and technical competence can give companies a competitive edge. All new ways and means should be used to improve technical education all over Europe and to use more effectively the European teaching resources in the field of technology.

- The importance of technology is not properly reflected in the educational priorities of Europe
- Constant shortages of engineers in many new technologies
- Technical studies are not attractive enough to young students
- New needs for continuous education and basic and theoretical competence are not receiving enough attention.
  Training will not be effective if basic education is weak
- Training provided by most companies is concentrated on general issues and management based on short-term ad hoc courses. Technical competence demands longer-term education
- A European framework for continuously upgrading education in the important fields of technology could be developed to integrate knowledge and teaching resources

Compatibility and Co-operation in Education

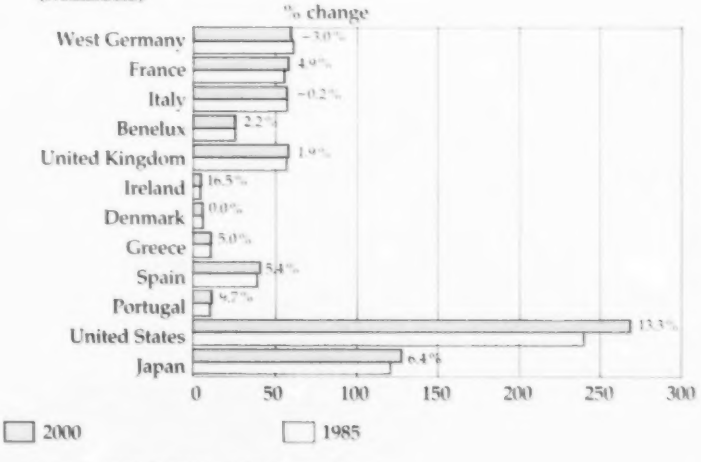
European education is founded on national premises and on widely diverging basic ideologies. Faced with European economic integration and the free movement of labour, national thinking needs to be replaced by a unified European concept.

Industry gives full support to the work of the EC in its efforts to seek transferability and compatibility and develop European education, as well as to promote the use of modern technology in enhancing the compatibility of education. The concept of European educational programmes could be applied at various educational levels, and throughout the European Economic Space.

A special issue in European culture is multilingualism. It is therefore of the utmost importance that a European can converse in the major languages of Europe. Tailoring school curricula to contain a **minimum of three languages** in every European country represents the real values of Europe's civilisation and recognition of a strength that ought to be fully utilised.

- European education is founded on national premises and divergent national ideologies
- Transferable and compatible minimum qualifications and degrees
- Compatibility of core curricula in Europe
- Three European languages in each basic school curriculum
- A common European business degree similar to the American MBA could be created. This could be called "a European Business Qualification" (EBQ) based on a European model of management development

Population 1985 and Projection 2000 (Millions)



Source: EUROSTAT, (1987) Luxembourg

Lifelong Learning and Adult Education

The concept of work is continuously changing. An individual not only has several jobs in a lifetime, but may also have several careers. Therefore, everybody needs continuous updating and upgrading of skills and competence throughout working life.

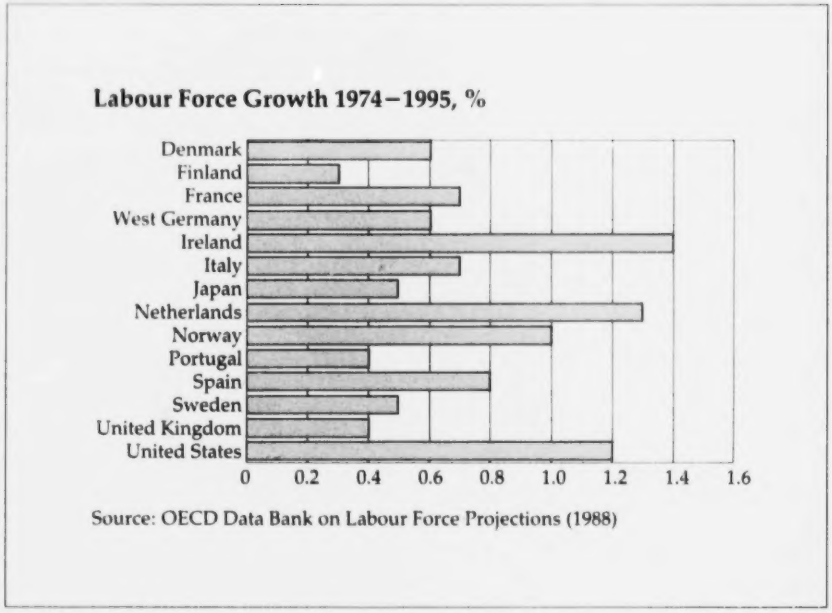
Europe does not have enough effective and motivational models and practices for adult education, especially for adults who study while working. Education at all levels is for young, full-time students. It is almost impossible for people in employment to study while working. The linkage with academic and professional studies is too tenuous. Basic programmes organised by educational institutions are sometimes too theoretical and do not inspire the sacrifices that re-education demands.

It is also clear that people cannot be trained if they do not have sufficient new basic education.

In view of the imminent shortage of labour in Europe, as highlighted in the report of the ERT Standing Working Group on Employment, it is even more important to have all possible age groups in continuous employment. Learning anew should thus take place alongside work. Lifelong learning should become an attitude and a practice. Present attitudes to education will have to change.

In order to facilitate the concept of **Lifelong Learning**, industry and educational institutions could work in close co-operation, developing tailor-made curricula for the re-education and further education of adult employees while they remain in their jobs. After qualification, such studies not only could but should result in the award of a degree. Where appropriate, they would be complemented by joint

Courtesy of Siemens



Source: OECD Data Bank on Labour Force Projections (1988)

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research projects to familiarise employees with scientific thinking and methods.

Institutions like the **Open University** should spread to European countries, with arrangements between administrations to co-ordinate the development of curricula, educational software and programme exchanges between countries, universities and industries. The possibility of establishing a European Open University could be studied.

The concept of **Open learning** could be enhanced by establishing **a European Educational TV Network**.

Professional studies could be accepted as part of the credit in the educational system. The concept of professional competence acquired outside the academic environment could also be brought into the credit structure of universities and other institutions of higher education.

- Lifelong learning should become the guiding principle
- Politicians, opinion leaders, trade unions and industry alike should do their utmost to improve adult education
- Educational institutes should change to accommodate the new demands of adult students
- Companies should generate an atmosphere in which competence and education are esteemed and supported. Education has to be viewed as an investment in line with corporate strategy
- Competence and education are an individual's assets. It is up to individuals themselves to update and upgrade this capital in order to preserve their personal competitiveness and develop to meet the new demands of the working environment. Opportunities for studies alongside work could be provided.
- Open learning is one of the new models incorporating schools, teachers, satellite programmes, and other facilities in providing and distributing education
- Open University-type activities both nationally and within a European context are needed
- A European educational TV network could be created

Implementing the Recommendations

General Issues	Industry	Educational Institution	Educational Authorities	Government	International Organisations
Lifelong learning	Enhancing study while at work; Conducting education as an incentive	Studies tailored for working adults	Studies for working adults; Transferable programmes	Reallocation of funds	Relevant funds for education; Reallocation of funds; Support and enhancement of the lifelong learning concept
Adult	Attitude changes to support learning and appreciate the value of education	Adaptation to the open learning concept	Reallocation of educational resources; Flexibility in educational systems	–	Preparation and promotion of ways for adult education on all levels
Significance of technical and professional studies	Targetted and tailor-made programmes; Continuing educational programmes to update engineering competence; Activities to inform and promote future job requirements of industry; Apprenticeships	Targetted and tailor-made programmes; Close co-operation with industry	Allocate resources; Setting and expansion of sciences and modern technologies	Transferability and compatibility of exams	Transferability and compatibility of exams; Emphasis on modern technologies
Industry/ Education Co-operation	Integration of public education programmes into human resources development programmes; Expansion of local and regional industry/education institution co-operation; Encouragement of industrial employees to act as part-time teachers; Teacher apprenticeships in industry	Increased industry representation on administrative boards; Increased thesis research work	Enhancement of all activities concerning industry/educational institution co-operation	Enhancement of activities concerning industry/educational institution co-operation; Enhancement of European open university	Increase and expand the areas of adult education programmes; Enhancement of European open university
Revitalisation and development of education and training	Participation in the development of school curricula and educational tools; Participation in teacher retraining programmes; Creation of a European educational TV network	Introduction of new educational tools; Enhancement of the open learning concept; Creation of a European educational TV network	Flexible and short-term educational programmes; Enhancement of the open learning concept; Creation of a European educational TV network; New programmes, frameworks and tools	Funding for the development of new educational tools; Continuing retraining programmes for teachers; Creation of a European educational TV network	New programmes, frameworks and tools; Creation of a European educational TV network
Harmonisation and co-operation in European education	Support and participation in European educational programmes; Recruitment policy enhancing European degrees; Enhancement of international apprenticeships	Transferability of studies and exams; Exchange programmes between educational institutions; Core curriculum; Three European languages	Minimum standards and qualifications for professional degrees; Core curriculum	Minimum standards and qualifications for professional degrees	Minimum standards and qualifications for professional degrees

Basic Education	Industry	Educational Institutions	Educational Authorities	Government	International Organisations
Modernising curricula	Formulating knowledge requirements	Adopting new technologies; Adopting core curricula	Formulating and implementing curricula changes and specifying levels; Formulating core curricula with emphasis on math, physics & new tech.	Policy and financial support	Transferability and compatibility of educational qualifications
Teacher training	Work experience for teachers; Assessment of teachers' competence – "industry inspectors"	Updating teacher training and continuous education; Assessment of teacher competence; Retraining teachers	Facilities for teacher training; Setting and resetting teacher competence standards	Economic incentives for teacher training and retraining; Funds and resources for teacher training	Facilitation of international teacher training programmes and teacher competences
Language training		Offering teaching in at least three languages	Setting minimum standards for languages	Setting basic language requirements	Promoting three languages throughout Europe
New skills	Feedback mechanisms to educational institutions	Co-operation with industry	Co-operation with industry	Standards for new skills	International standards for new skills
Information technology	Software for classroom use	Software for classroom use	Software for classroom use	Fund allocation	International educational software packages

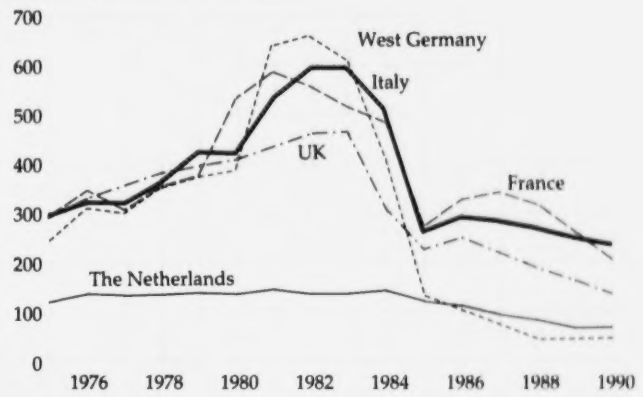
Higher Education	Industry	Educational Institutions	Educational Authorities	Government	International Organisations
Networking	Co-operation with educational authorities and international organisations; Creation of technology centres and intermediate centres	Co-operation with industry and international organisations	Co-operation with industry and other educational institutions and authorities; Creation of technology centres and intermediate centres	Creation of technology centres and intermediate centres	Co-operation with industry and educational authorities and institutions; Creation of international technology centres
Open University	Providing teachers and students; Funding distance teaching and open universities	Providing teachers; Development of distance teaching; Development of open teaching	Creation of programmes for open universities	Funding of distance teaching and open universities	Compatibility and transferability of qualifications; Support for distance teaching and open universities
Student Exchange	Apprenticeship programmes	Education exchange programme development	Education exchange programme development		
Education Efficiency		Shorten average study time	Shorten average study time	Set norms	Set norms

Vocational Education and Training	Industry	Educational Institutions	Educational Authorities	Government	International Organisations
Work placement and apprenticeships	Provision for apprenticeships; Encouraging skilled workers to become industrial tutors	Reformulating curricula to adapt to work placements; Acceptance of industrial tutors	Setting standards for work placements	Legal framework for work placements	Promotion of international apprenticeships
Partnerships	Co-operation with educational authorities and institutions	Co-operation with industry; Co-operation with local educational institutions	Co-operation with industry; Co-operation with other educational authorities; Acceptance of industrial tutors	Co-operation with industry; Acceptance of industrial tutors; Adaptability to new requirements	Co-operation with educational institutions and authorities and industry
Policies	Emphasis on long-term policies and treating VET as an investment, not a cost	Plan for education provision for young people and adults as a basis of short and long-term VET	Setting standards for educational element of VET for youth and adults	Tax incentives and concessions	Guidelines for norms
Training	Emphasis on non-supervisory and non-managerial workers	Collaborate with industry to begin training as early as possible, using industry's and educational institution's resources	Recognise relationship between interdependence of training and education and work with industry on standards	Facilitate training by recognising roles of industry and national and regional training establishments	Promulgate good practice and work for international recognition of qualifications indicating competence

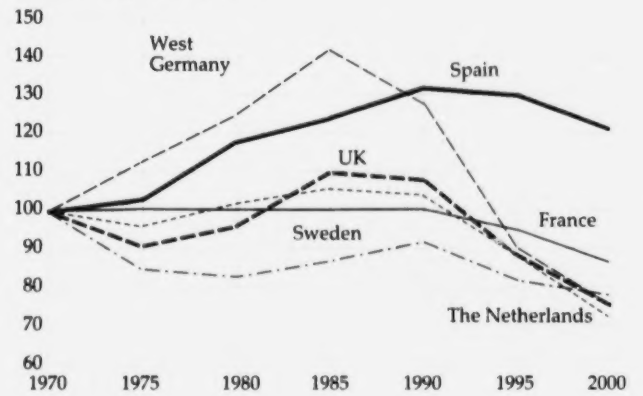
Management Training	Industry	Educational Institutions	Educational Authorities	Government	International Organisations
Teachers	Promoting industrial tutors	Open educational institutions to outside teachers	Open educational institutions to outside teachers		International teacher transfer
Curricula	Promoting industry related courses; Encouragement of tailor-made curricula	International case-oriented studies; Implementing business studies in other curricula	Integrating management studies to academic and professional studies		Transferability and compatibility of degrees; Setting minimum standards
Management development needs	Identification of needs; Increase co-operation with existing business schools and create new ones where needed	Identificaton of needs; Flexible modular education system	Flexible modular education system; Credit and accumulation system		Transferability and compatibility of modules; Credit and accumulation system; Harmonise and raise levels and standards for qualifications
Staff exchange	Teacher working opportunities in industry	Promote staff exchange	Promote staff exchange		Promote staff exchange
Languages		Continuous language training	Set language standards		Set language standards
Entrepreneur schemes	Develop and promote entrepreneur schemes	Develop and promote entrepreneur schemes		Develop and promote entrepreneur schemes	
Networking	Salary compatibility industry/business schools	Salary compatibility industry/business schools	Salary compatibility industry/business school; Crediting management studies with academic studies		
Distance business schools	Participation	Participation	Participation	Participation	Participation

A Framework for Action

Number of 15-year-olds Entering the Labour Force Minus 65-year-olds Leaving It



Student Boom and Slump Population aged 20 to 24



European education could be given a fresh start by adopting models similar to those already applied in R&D. One such might be a programme for the advancement and co-ordination of research into the development of education in various European countries; a tentative name for this model might be EURED (or "European Unified Research into Educational Development"). EURED could become a framework for the advancement of education in Europe. It would be based on co-operation between

- legislative and regulatory bodies, such as national and European education authorities
- providers of education, such as universities, schools and institutes
- users of education, such as industry and the service sector

Some parts of the framework to be considered are:

EURED STANDARDS, as a co-operative project between national and European authorities, together with selected educational institutions, for facilitating the transferability of degrees drawing on the experience of the European Community Action Scheme for the Mobility of University Students (ERASMUS)

EURED TEACHER TRAINING, as a co-operative programme for improving and updating teacher training at all levels. The principal theme is the education of the existing workforce, with emphasis on:

- updating the knowledge and skills of teachers
- imparting/renewing the skills and knowledge for teaching contemporary subjects like information technology, computer science and telecommunications
- improving the awareness of business and industry among basic school teachers.

EURED SCIENTIFIC, as a host of scientifically-oriented post-graduate programmes catering for the educational needs of European research programmes, such as COMETT and SCIENCE in relation to EUREKA, BRITE, ESPRIT, RACE, and in a larger framework to EUREKA, with the purpose of disseminating the knowledge created by these projects throughout Europe

EURED OPEN STUDIES, as a co-operative project on the part of national authorities and users of education, aimed at enhancing the development and use of different modes of open education, for example to strand D of the EC COMETT programme and to DELTA

EURED LIFELONG LEARNING, as a joint development programme organised by selected institutions and users of education to develop and promote the concept of lifelong learning

Education in the European Economic Space

Education and training within Europe are characterised by two major features – their historical roots and the present rapidity of change. Current educational and training systems have evolved over many centuries. The origin is found in the Middle Ages when the church catered for the educational needs of society. After the French Revolution (1789–1799) general school systems based on compulsory education were introduced on a national level in order to strengthen nationhood and citizenship. The pressures and requirements of the industrial revolution had effects on curricula, especially where technical subjects related to vocational education were concerned. A strong national educational system was the basis of schooling. Each nation emphasised different aspects in education, which reflected a strong cultural identity. The emphasis was on imprinting the unique cultural characteristics of each nation. National differences were emphasised and highlighted, not a mutual heritage. This led to different curricula and school structures for each nation state. Thus terms like school, college and other educational institutions are not directly comparable in different European countries.

The situation today is not related to the requirements of nationhood or basic industrial educational needs. In a unifying Europe with a free labour market and transferability and compatibility of skills the requirements on the educational systems are different. Today similarities are sought, not differences. The concept of strong nationalism has been taken over by Europeanism. Diversity and separate identity should be overcome and exchanged for educational systems which are mutually strengthening and supportive.

Education accounts for at least 5% of GDP in almost every OECD country. With few exceptions, public investment in education varies between 4 and 7% of GDP. The EFTA countries spent an average of 6.2% of GDP on education in 1980. The EC countries spent an average of 5.4% in the same year. The United States invested 5.6% and Japan slightly less, 5.5%.

Figures for Belgium are not available for 1970–1983. In 1984 and 1985 Belgium's public expenditure as a percentage of GDP in current prices was 5.9.

This means that Europe invests the same or more in education than the United States or Japan. One of the main problems in Europe's case is the selectivity and allocation of this investment. The recommendations presented earlier in this paper highlight the ways in which the Round Table would like to have some of these investments reallocated.

Public expenditure on education as % of GDP at current prices

	1970	1980	1981	1982	1983	1985
Austria	4.6	5.5	5.7	5.9	5.9	5.2
Denmark	6.7	6.6	–	–	–	6.5
Finland	5.9	5.4	5.5	5.5	–	5.4
France	–	5.1	5.2	–	–	4.8
Greece	2.1	2.2 [2]	–	–	–	3.7
Ireland	5.0	6.3	6.7	6.2	–	4.4
Italy	4.6 [1]	5.0	5.5	5.5	–	5.1
Japan	3.1	5.5	5.5	5.4	–	4.6
Luxembourg	4.6	7.4	7.6	8.3	–	6.4
Netherlands	6.8	7.6	7.4	7.3	–	5.3
Norway	6.0	5.9	6.2	6.3	6.3	5.0
Portugal	–	4.1	4.4	4.2	–	3.5
Sweden	7.2	9.0	8.4	8.2	7.6	5.8
Switzerland	4.1	5.2	5.1	5.2	–	–
United Kingdom	5.3	5.5	5.4	5.4	5.3	4.4
United States	6.4	5.6	–	–	–	5.8
West Germany	3.7	4.7	4.7	4.6	4.4	4.4

[1] 1971 [2] 1979

Source: OECD 1987, 83

Expenditure by companies on training is subject to variation. In 1984, United States employers spent $30 billion on the formal training of 15 million employees and $180 billion on informal in-company training. In contrast, the United Kingdom compares very unfavourably with its main competitors in terms of investment in training by industry. For example, expenditure on training per employee is £1,500 in the United States, while it is only £200 in the United Kingdom. In West Germany, it is estimated that more than one million adult employees receive continuing education each year, half of which is provided by companies. In Japan, about 80 per cent of all firms implement some form of training and one third of all workers participate in formal courses. In France, company expenditure within the framework of the 1972 Training Act amounted to 14.7 billion FF in 1982, and involved 113.5 million hours of training (OECD 1988,7).

The companies surveyed by the Round Table stated that they invest on average about 2 % of their wage totals in education, the highest figure being 6.3 % (Siemens, West Germany, 1987). Most Round Table companies are increasing their investments in education. French companies spend more than the minimum legal requirements of 1.1 % of wages on education. The figures above are not directly comparable because of the content of what is included in various companies' figures. Some companies, for example in West Germany, have included the cost of apprenticeship. In other cases accommodation and travel costs at courses are included and sometimes they are not. There are also various national discrepancies. In France, where there is a minimum legal required for education, high figures may be sought. In other cases this may be irrelevant. To a significant extent various national accounting practices influence the funds spent on education.

No unified practices on a European level can be identified.

The training and education responsibility assumed by industry has increased in recent years. In Sweden, for example, firms are giving basic education on company time to an increasing extent; 0.27 % of wages go to supporting public adult training, not necessarily company specific. In 1985 the Swedish government took 10 % of company profits (in the form of a special tax) for "personnel renewal fund", i.e. a fund to be used within 5 years for the education of its personnel, with the remainder forfeited to the State after that.

Most young people go to school until the age of 16–17, after which enrolment figures fall rapidly. At 17 more than 70 % still attend some form of school, but at 18 the figure falls to approximately 50 %, and at 19 it is only 36 % (OECD, 1987, 72).

International statistics in education are not directly comparable. For example, in some European countries, many young people continue upper-secondary level education one or more years after finishing school at 18.

The percentage of 17 year olds attending educational institutions is highest in West Germany, Sweden and Japan, followed by the United States and some small European countries like Holland, Belgium and Switzerland. Japan and the United States are the only countries besides Canada where a majority of students obtain the credentials necessary for entering a university.

In West Germany, Austria and Switzerland, the majority of upper-secondary students are apprentices who undergo part-time, general education in schools for 1 or 2 days a week. In these countries the system is selective and only a small proportion of students have an opportunity to study at university level. In the rest of Europe, upper-secondary education is usually split between general and vocational streams. In the United Kingdom, for example, apprenticeships do exist and are regarded as of increasing importance. Vocational training is now generally seen as a very important part of the educational and training scene there. Those who follow on from general secondary education normally continue with high school and often move on to academic studies.

The OECD (1987) notes that a comparison of the vocational training systems in Europe, Japan and the United States reveals two fundamental differences. First, much of the vocational training in Europe is given at the secondary level, while in Japan and the United States most of it belongs to the post-secondary sphere and tends to start at somewhat higher ages. Secondly, training in Europe – especially in the German-speaking region – is more standardised and integrated into the regular education system.

Industry's Opinions on Education

In the survey conducted by the Round Table the interview partners were asked to comment on education by educational level. More detailed findings appear in the forthcoming book "Education for Life: A European Strategy". A synopsis of some characteristic concerns are shown by geographical region on page 21.

Concerning **basic** education, i.e. education in the primary and secondary level, the main difficulties were found in the general need to raise the level. In other words educational standards were found to be too low to match the competence requirements of industry. The respondents highlighted the need to develop communication skills and the ability to work in teams, with the emphasis on problem-solving capabilities. Another shortcoming identified was a poor understanding of the economic environment and the nature of business and profit making.

The respondents looked for a general change in teachers' attitudes to the realities of economic life. Without an understanding of what goes on in the real world a mismatch between what is produced by schools and expected by industry will continue.

One of the reasons for deficiencies in education and teaching was found in the present attitudes of primary and secondary school teachers. They are either not properly motivated, or lack the capability to promote the emergence of more flexible and adaptable forms of basic education, allowing for several careers in the future.

Comments by education and training managers of major European companies differed little from one region to another. On the other hand, regional differences were identified in the case of **vocational education and training (VET)**.

Respondents in the German-speaking region were quite satisfied with the public VET system. This satisfaction was not, however, without qualification. There seemed to be additional needs for language training and mathematics. Some attitude changes were also sought in relation to problem-solving and the ability to work in a team. In order to remedy these deficiencies still closer contacts were sought between VET institutions and industry.

In the Latin region the VET institutions and industry seem to be moving apart, as they do not follow industry's needs, for example in some technical areas, crafts and languages. The educational methods also seemed lacking as the students had an insufficient ability to learn. Suggestions to solve these problems pointed to closer formalised contacts between VET institutions and industry.

Similar difficulties were perceived in the English-speaking region, where the standards of public institutions are not considered to match industry needs. There is a need for problem-solving and learning skills, in addition to which VET standards are lacking in transferability.

In the Scandinavian region industry seemed to be quite satisfied with education and training related to VET. Some criticism was expressed concerning too little training time and emphasis on mechanical engineering. There appeared to be a general need for the enhancement of communication skills.

In all regions the question of international transferability and comparability was highlighted as being the major single problem area. There was a clear demand for transferable VET degrees throughout Western Europe. Several areas of retraining needs were specified, knowledge of languages being the major one. Other subjects in which retraining was found to be necessary included information technology, electronics, mechanics, mathematics, management and commercial skills. Environmental subjects were also mentioned as one area of retraining that deserved special attention.

Higher education (i.e. college and university) is considered part of public education. The number of people with higher education or post-graduate degrees employed by the companies surveyed represented an average of 10% of their total workforces. The highest proportion of employees with higher education degrees is in the defence industry, followed by the oil, electronics and automotive industries. The academics were also often young and had only recently entered working life. No significant national differences could be identified.

An education in an area of technology is the most highly valued basis for employment in industry. The companies surveyed complained of difficulty in recruiting engineers in sufficient numbers, with demand remaining high. The main demand was in the fields of

Opinions Concerning Companies' Problems, Surveyed with Respect to Education on Various Levels

Level of Education	German	Latin	English	Scandinavian
Basic, general education (primary and secondary education)	The general level of competence should be improved. On the whole, everything could be better.	The capability to learn should be improved as well as general behaviour and languages.	General level of competence should be improved, skills and the ability to solve problems. The capability to learn should also be improved.	General level of competence should be improved, as well as communication skills.
	Need for: Core curriculum	**Need for:** Teamwork	**Need for:** Core curriculum Communication skills Problem-solving skills	**Need for:** Communication skills Language skills
	Problem areas: Teachers' attitudes Lack of understanding of the economic environment	**Problem areas:** Languages Teachers' attitudes Lack of understanding the economic environment	**Problem areas:** Discipline Effectiveness Teachers' attitudes Lack of understanding the economic environment	**Problem areas:** Attitudes Languages Reading/writing Teachers' attitudes
Teachers' attitudes (Basic education)	Indifferent and do not understand	Indifferent, but beginning to understand industry needs	Do not understand industry needs	Do not understand industry needs and in general are indifferent
Industrial retraining	The companies are satisfied with the public VET system	The VET given in public institutions does not match industry needs, i.e. in technical areas, economic thinking and crafts	The standards given by public institutions do not match industry needs as to languages and crafts	In general satisfied. Criticism concerning narrow training base, mechanics
	Need for: Languages Ability to work in teams Mathematics Problem-solving	**Need for:** Ability to learn Languages	**Need for:** Learning skills Problem-solving skills	**Need for:** Communication skills
	Problem areas: Contacts between VET institutions and industry Transferability	**Problem areas:** The need for formalised contacts Transferability	**Problem areas:** VET standards Transferability	**Problem areas:** The lack of new VET Transferability
	Major areas of retraining: EDP, informatics, data processing, management and commercial skills, languages, environmental subjects	**Major areas of retraining:** Languages, math, computers, management skills, electronics	**Major areas of retraining:** Languages, management, marketing, data processing	**Major areas of retraining:** Electronics, management, security, mechanics
Main issues regarding education	Communication abilities Holistic thinking Business initiative Management Broad education Problem-solving	Flexibility Management Communication skills	Communication skills Business administration Strategic thinking	Management Business administration Internationalisation Culture

electronics, computer science, logistics, chemistry and information technology.

The demand for graduates in most fields is expected to continue throughout the 1990s, and even to increase in some countries. Most companies pointed out that there will be a continuous marginal increase in the number of graduates in their company. This is especially true for the electronics, telecommunications, automotive and defence industries.

In general, the companies were satisfied with the level of knowledge possessed by newly hired graduates. Most assessed the level of basic education as good or very good. The level of applied knowledge was considered either satisfactory or good. The best marks were awarded by German, Latin and Scandinavian companies. The electronics and telecommunications sectors were most satisfied.

In many instances graduates' education was complemented within companies, notably those in the electronics, telecommunications and automotive industries. Only seldom was education complemented outside the company.

Besides dealing with concrete subjects, retraining is also expected to engender a new attitude. Graduates from universities and other institutions of higher education should be equipped with the ability to think holistically and have the capability to communicate and take initiative. They should in general be aware of what takes place around them; thus their educational background should be broad, including a sense of culture.

Courtesy of Carlsberg

Courtesy of Siemens

Summaries of Subcommittee Reports

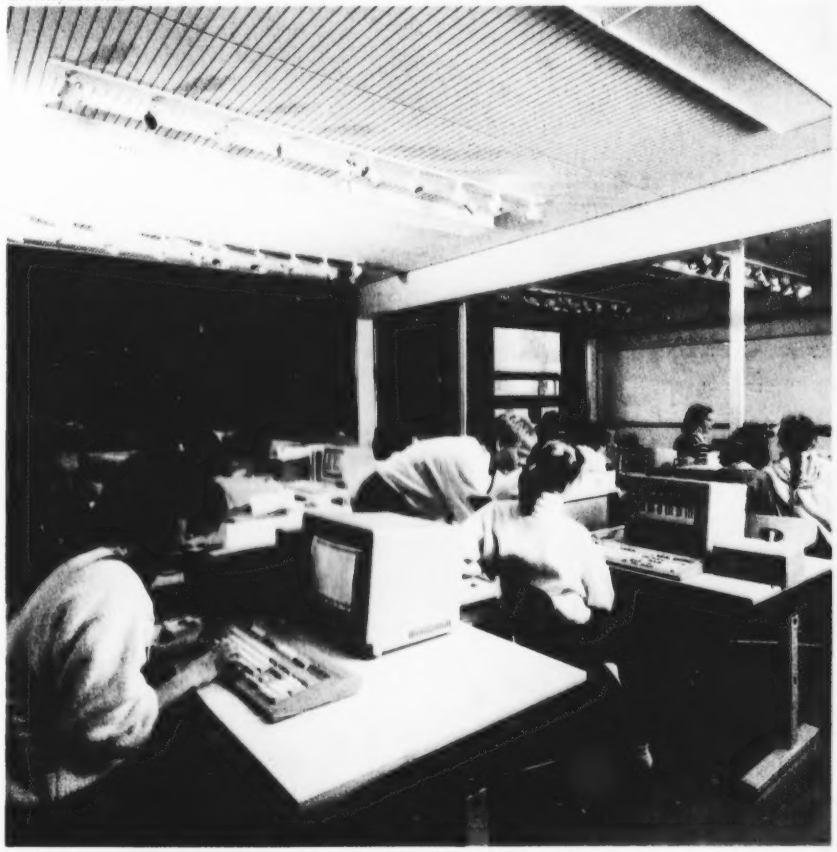
The summaries of the four subcommittee reports: Basic Education, Higher Education, VET and Management Training are not directly comparable.

The subcommittee for Basic Education based its study on an analysis of the different educational systems in Western Europe, highlighting differences and convergences. The desk study was complemented by conducting interviews with selected companies, primarily in the Latin region and Scandinavia. The study identifies problem areas and seeks to find remedies.

Responsibility for solving the dilemmas facing basic education in Western Europe is not only the concern of educational institutions, but hinges on the increasing input that is needed from industry. The report emphasises co-operation and wider responsibility on the part of all parties concerned.

The report on Higher Education is concerned with diversity and low per capita figures for university degrees in Western Europe compared to the United States and Japan. It notes that the basic academic level of higher education is good in Europe, but weaknesses are found in the low numbers of post-graduates. This difference is specially highlighted in the field of technical studies. The report emphasises closer co-operation between industry and institution of higher education. It draws upon examples in Western Europe, specifically in Scandinavia.

Courtesy of Nokia



The VET report is concerned with the general trend towards using vocational training and education primarily as a tool to solve short-term, often production-related difficulties. It suggests that VET should be brought closer to the concern of top management and treated as an investment in the future prosperity of the company in the long run.

The report on Management Training notes the emergence of a European management model specifically catering for the requirements of the single market after 1992. It also highlights organisational changes taking place within Round Table companies as a consequence of technological innovation and structural transformation.

Basic Education

Education is by far one of the major, if not the most important, factor for the future development of Europe and the well-being of all those concerned.

Education involves the co-operation of many partners and institutions. It is important to recall the role that parents and the family environment play in the educating process. During the childhood years, this environment influences the personality, open-mindedness, human-relations and general attitude towards life. Research has also shown the determinant part that parents play in the choice of studies and career.

Enterprises are the major job creators: holding a degree and/or a profession, as well as the up-dating of one's knowledge, has become necessary in order to enter the business world. At the present time, these advantages are no longer sufficient because recruitments and subsequent promotions are also, if not primarily, based on other aspects of the candidate's personality. The talents and skills of a candidate which attract corporations are already deeply-rooted before entering into an educational system; but for ideological or other reasons, teaching institutions do not necessarily contribute to the further development of these talents.

Education in Europe includes 8 to 9 years of general or compulsory schooling, often complemented by 2 or 3 years of technical or vocational work-oriented education. Basic education is not static, but continuously evolving. There is a general indication against expanding compulsory schooling further. As to the quality of education, repeaters, late starters and slow learners are foci of special concern. There is general concern about the high number of drop-outs, which leads to inadequate mastery of skills and knowledge relevant to the contemporary job-market. They are often considered to have inappropriate attitudes, values or both. There is emphasis on the development of a core curriculum leading to minimum competence for everybody, combined with options that suit each child's abilities.

Basic education has a variety of cultural missions in addition to giving young people the basic facilities to cope in life. Thus it is expected to achieve a variety of – often conflicting – objectives. Not only should an individual learn democratic values and a common culture, but also the right mix of professional and general skills. The main concern is thus on the efficiency of the school system in supplying young people with the requirements of society and those of working life. Therefore there seems to be a variety of major issues that basic education has to face:

- There is little concern for interdisciplinary knowledge focussing on contemporary problems;
- The curriculum is often too theoretical and it is difficult to adapt it to the knowledge explosion in today's multifaceted society;
- Cognitive skills should be stressed at the expense of non-cognitive skills;
- Teaching and learning methods stress individual performance rather than teamwork. Education practices continue to foster recitation mode rather than reflexive attitudes;
- There is manifest discontent with the performance of teachers. Provision for significant retraining opportunities is inadequate to maintain competence of practising teachers;
- Electronic teaching aids are only used to a marginal extent;
- The school organisation is often marginal and beset by a range of various bureaucratic constraints;
- The relationship between school and the community is not sufficiently developed.

Length of compulsory schooling

	Sweden	UK	Netherlands	France	Italy	West Germany	Spain
Compulsory schooling:							
Starts at age	7	5	5	6	6	6	6
Lasts for (years)	9	11	9	9	8	9–10	8
Proportion of children not reaching the end of compulsory schooling under normal conditions	8 %	n.a.	10 %	10 %	9–11 %	5 %	n.a.

Several areas of reform which, if properly implemented, could solve at least to some extent the problem areas that have been identified.

- School curricula have to be modernised to cater for professional competence. Thus the organisation of fundamental basic skills should take precedence over other aspects. Systematic exposure to mathematics, science and technology, including information technologies is a significant part of the modern literacy package all young people should receive. In addition there should be an emphasis on cognitive skills at the expense of purely manipulative skills. Skills ought also to be transferable and applicable to a range of jobs in different sectors of the economy. Finally, there is an emphasis on social communication skills, which are fundamental to the effective functioning of modern work organisation.

  It should be noted that secondary level technical and vocational education does not provide society with the final or finished product. On-the-job learning retains its importance on all levels.

- Appropriate assessment and certification of skills acquired during basic education is essential to give young school-leavers a record of achievement which improves their competitiveness on the job market. New and improved systems of assessment and certification of vocational qualifications are called for.

  The quality of education can be more easily controlled if school curricula are based on educational modules, which could supplement or displace subjects. Modules require clearly stated short-term learning objectives, which reinforce student motivation to learn and encourage self-study methods.

- School-based education and work-based learning should be combined. The combination of education and work-based learning should be expanded. This requires new attitudes to work and also a wider official certification of many in-company training schemes. The apprenticeship system currently in force in some countries provides an example of what can be done.

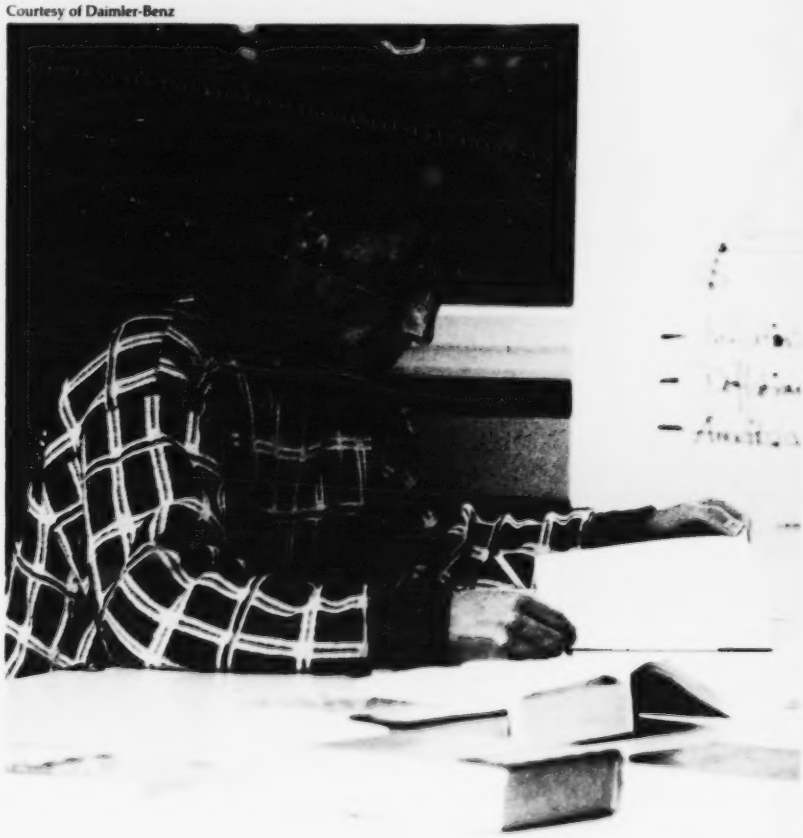
  Raising the qualifications of in-company instructors is one of the key elements in developing this field.

- Modern technologies should be introduced into teaching and learning, the trend being towards multimedia education. The potential of new technologies is great. New methods in classroom teaching can be introduced, because they foster flexibility in learning time and encourage self-study.

  The introduction of new technologies also requires a re-examination of the curriculum for basic skills and encouragement for the development of more cost-effective distance education.

- The last area of difficulty concerns the retraining of teachers.

Courtesy of Daimler-Benz



Nothing lasting and really important can be achieved in education without a highly qualified and motivated teaching force. Due to the small intake of new teachers the main emphasis is on in-service teacher training. But there are obstacles, the main areas being the fact that the supply of in-service training opportunities are unco-ordinated and not geared to the teachers who need it most. Secondly, there is little incentive for teachers to attend courses in order to improve their qualifications, and finally there are no financial rewards attached to in-service training, as courses often have to be attended on a more or less voluntary basis.

Little progress will be achieved until in-service teacher training is regarded as part of teachers' normal career development.

Industry recognises its responsibility to take part in the development of basic and secondary education and that it can make decisive contributions in this area.

The Economic Week, given by **Holderbank**, the Swiss holding company through the Ernst Schmidheiny Foundation, is a varied teaching programme which gives the participants in high-level teachers' training colleges and grammar schools basic knowledge of business and economics. The instructors, mainly executives from a large number of Swiss enterprises, are all practitioners, and teaching always features practical examples taken from the business life of the teaching staff.

In defining new skills industry bears responsibility for feeding new developments at the workplace back to schools. This can be done effectively through continuous contacts between schools and industry, but also by implementing organisational changes.

The existing committees between schools and industry deserve critical review and, possibly, reorganisation to improve their effectiveness. On the other hand, industry could set up a body to examine current school-level practices in the teaching of specific skills.

On-the-job learning could be further enforced by expanding apprenticeship and enabling qualified workers to act as industrial tutors. Local teachers could also be provided with industrial experiences.

Thus basic education is the first responsibility of all parties concerned: parents, the authorities, schools and industry. It can successfully be developed only through co-operation between all parties concerned.

Higher Education

The Round Table analysed higher education from various points of view. A comparison was made between the educational systems in Europe, the United States and Japan and conclusions drawn from it. A general analysis of quantitative trends in the European OECD countries was conducted and the ERT-related companies' opinions elicited. On the basis of these inputs conclusions were drawn concerning the future needs and changes relevant to industry in the sphere of higher education.

The term higher education is here considered to refer to levels 5, 6 and 7 of the standardised classification of education used by UNESCO. This corresponds to the student age of 17 or 18 in a normal curriculum. The largest number of students per 100,000 inhabitants in 1986 was found in the United States (5,178) followed by Western Europe (2,095) and Japan (2,006). The number of diplomas or degrees on various levels varies. The highest number of post-graduate university degrees was found in the United States (21%), followed by Western Europe (13%) and Japan (4%). The number of graduate university degrees was highest in Japan (65%) followed by Western Europe (62%) and the United States (54%). The number of students with intermediate university diplomas was highest in Japan (31%) and the same in both Western Europe and the United States (25%).

A comparison between the Western European and American higher education systems reveals that the Europeans do not make sufficient use of the good basic training achieved through specialisation on a post-graduate level, as only some students go into research.

During the first half of the 1980's there has been a general quantitative growth of student numbers in Western Europe. The number of engineering students increased by a quarter from 1980/81 to 1983/84. There has also been quantitative growth in the number of graduates (15%), corresponding to the increase in the number of students. This increase fails to match the corresponding numbers in the United States and Japan.

When OECD data on the various Western European countries is compared, a decline in the emphasis on higher education in general can be identified. This is a concern because scientific and technological changes, as well as the demand for related professionals, is increasing rapidly. In order to solve this problem educational systems in Europe have to increase their general flexibility. New mechanisms such as intermediate changes of streams between careers, retraining, and recycling of graduate programmes have to be instituted.

There seems to be a need to complement the traditional university system with new public and/or private initiatives. It stems from a

deficit of professors in new technological areas or in sectors of very rapid growth. In order to train the trainers (professors) in the short-term it may be necessary to start new programmes such as training abroad and utilising professionals from industry. There is thus an inherent need to increase co-operation between universities and industry to meet the new demands. Without detracting from the autonomy of universities, which guarantees variety and richness in scientific and cultural life, it may seem advisable in many cases to improve collaboration with the business world. This is significant both in relation to the investigation capacity inseparable from centres of higher education and in developing the function of such centres in training new professionals.

Closely related to this is the "spin-off" effect in the form of new businesses and innovations, which characterises the higher education system in the United States. For example, more money is spent on continuing education than for initial university level education.

Universities in most Western European countries have been slow to enter the market for continuous education. Shrinking public funds and increasing costs have put many universities in a position where it will be not only advisable but also necessary to enter into agreements with industry in this field. Co-operation between universities and industry is to an increasing extent taking place in countries like the United Kingdom, West Germany, Scandinavia and Spain.

In order for such co-operation to be fruitful, national governments, universities and industries have to

Age distribution of enrolments in university and non-university higher education institutes

			Under 20	20–24	25–29	30 +	Unknown	Total
Denmark	1983	Univ.	4.1	42.1	28.4	24.7		100
	1983	Non-Univ.	3.3	63.7	22.8	12.3		100
Finland	1983	Univ.	4.8	45.6	29.4	20.3		100
France	1982	Univ.[1]	21.3	44.7	19.3	14.7		100
	1982	Non-Univ.[2]	51.5	45.5	2.1	0.9		100
Greece	1981	Univ.	30.3	52.7	9.4	4.1	3.5	100
	1981	Non-Univ.	54.7	41.0	3.0	1.3		100
Ireland	1983	Univ.	45.3	45.5	5.3	3.9		100
	1983	Non-Univ.	36.3	46.6	9.1	8.0		100
Netherlands	1983	Univ.	13.3	47.6	24.6	14.5		100
	1983	Non-Univ.	17.0	44.0	15.8	16.3	6.9	100
Spain	1981	Univ.	25.4	49.7	11.1	7.5	8.1	100
	1981	Non-Univ.	28.4	43.9	9.8	2.4	15.4	100
Switzerland	1983	Univ.	15.5	50.3	21.8	12.4		100
	1983	Non-Univ.	6.5	53.6	23.0	16.9		100
UK	1975	Univ. only[1]	39.5	53.9	4.1	12.4		100
	1981	Univ. only[1]	34.7	45.7	8.6	11.0		100
United States	1981	Univ.	24.1	40.8	14.5	20.6		100
	1981	Non-Univ.	32.9	29.6	13.2	24.3		100
West Germany	1983	Univ.	3.9	51.1	31.2	12.8		100
	1983	Non-Univ.	29.8	40.3	12.8	2.1	15.1	100

[1] Figures refer to universities only and not to all university type higher education.
[2] Includes only the IUT's (Instituts Universitaires de Technologie).

Source: OECD Education Statistics

find ways to eliminate the obstacles and barriers hindering this kind of co-operation. On the **governments'** side it is important to adopt laws and regulations which support universities and industries in developing such forms of continuing education matching national needs and fostering international co-operation.

Universities have barriers of a different kind mainly related to their historical role, budgetary restrictions and the academic staff's limited contacts with industry. Here new attitudes have to be developed as well as new models and contents for teaching. **Industry** on its part could provide an environment which is supportive of education and needs to provide co-operation between university and industry.

The main theme and principal conclusion is the need to create closer co-operation between university-industry and local networks throughout Europe.

Vocational Education and Training

VET is seen as one of the critical success factors in the achievement of business strategies and plans. The main issue is that there is no support for the development and implementation of pan-European VET policies.

Another important issue is the VET response to uncertainties and market pressures. Most companies aim to make training more flexible, respond more rapidly, grasp short-term human resource development needs, adopt a long-term orientation and link VET with general long-term strategies.

Companies are keen to ensure that their current operational capability is not impaired by people who cannot adequately perform the tasks which need to be done. Most companies are aware that short-term "market responsive" training alone will not develop the strategic capability they need. Its exclusive pursuit will increasingly become a constraint on their commercial strategies. As a consequence, they see a need for complementary VET policies with longer-term aims:

- training support to enable the workforce not only to adapt to

Educational Attainment of the Labour Force (Selected OECD Countries)

Region and Country			Percentage of labour force with					
			Primary		Secondary			
		No Education	Incom.	Compl.	Incom.	Compl.	Higher	Mean Years of Schooling
Belgium	(1970)	3.9[1]	7.2	38.3	25.7	16.8	8.1	8.1
Canada	(1981)	0.0	3.1	10.2	26.9	23.9	35.9	11.7
Denmark	(1981)	0.0	4.9	39.3	33.5	11.7	10.6	8.6
Finland +	(1980)	0.0	21.5	26.3	11.1	33.2	8.0	8.5
France + *	(1982)	0.4	38.6	24.8	18.2	9.6	8.4	6.2
West Germany +	(1985)	0.7	0.0	12.5	53.9	19.4	13.5	10.4
Japan	(1979)	0.0	0.0	39.3	20.3	22.4	18.0	9.8
Netherlands	(1975)	0.0	1.7	31.3	44.9	11.2	10.9	9.1
Norway +	(no date)	0.0	2.1	0.0	67.7	16.7	13.4	11.3
Switzerland +	(1980)	0.0	4.0	21.8	9.2	49.4	15.6	11.0
United States	(1981)	0.0	2.1	7.8	18.8	35.8	35.6	12.6
Average of above[2]		0.4	6.8	20.3	34.0	22.1	16.3	10.0
		(0.4)	(7.2)	(27.5)	(61.5)	(83.6)	(99.9)	
Greece	(1984)	3.9	12.5	44.5	12.8	15.1	11.3	7.9
Portugal	(1981)	16.3	53.3	8.4	10.8	5.4	5.8	4.5
Spain	(1983)	13.5	9.5	47.6	10.8	8.8	9.7	6.2

Source: Psacharopoulos and Arriagada (1986), National Census Data

[1] Includes "unknown educational level"
[2] Cumulative figures in parenthesis

* Non-census data
\+ Educational attainment of the male population

change but to participate actively in it; i.e. "over-qualification" to maintain a flexible workforce with broad competence
- long-duration initial training which provides a basis for shorter-term further adult training when required
- in countries where apprentice training or some other form of general youth training covered almost all young people, companies strengthened and often expanded such training
- active participation in a national qualifications strategy and support for regulated schemes with national minimum standards
- long-term VET orientation linked with the strategic aims of the company, its strategic planning and personnel development in practice as well as an indication of intention
- a central VET budget for safeguarding longer-term aims (line managers and units spend what they consider necessary for additional more immediate purposes).

Approaches today are characterised by the following features:

- response to pressing day-to-day priorities by using flexible training systems
- capability to react quickly, by training workers in skills which are needed (or will shortly be needed) as a result of changes in production or service requirements
- those responsible for training are close to, and respond to the wishes of their line managers and business units
- programmes which train people to perform specific sets of tasks well and handle specific types of situations; such programmes, whether simple or more complex, are tailored to specific purposes
- dispensing with apprenticeship or other long-term VET schemes
- hiving off VET as an independent cost-centre or a separate business
- short-term responsive training used as a means of minimising training costs.

Unfortunately, the trend in some ERT companies is towards a growing pre-occupation with short-term policies. In part this is seen as a reaction to the remoteness of longer-term training aims, "they don't respond to today's needs", and in part it is seen as a closer integration of training with "what goes on" in the business. However, more powerful than these motives is undoubtedly the desire to minimise costs.

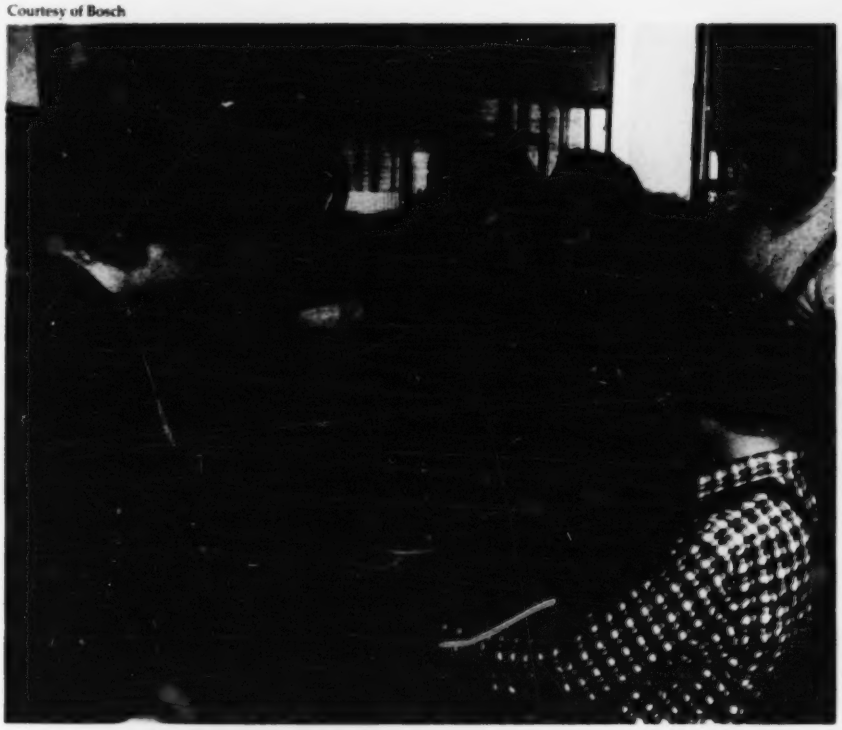
The main emphasis of VET policies and activities is on further training and retraining of adults rather than on initial training. Little support is given to non-job-related education, although some companies do support job-related education. Within further training, courses for adaptation and updating are more prominent than courses for upgrading or promotion.

Management Training

Management development is going through an expansion phase as demand for education soars in Europe.

Distinct differences in background among the young people from whom managers are normally recruited in various countries could limit managerial mobility within the EC after 1992. For example there

Courtesy of Bosch



are significantly different entry requirements for MBA programmes. Syllabuses vary in length and content.

Although management development has recently expanded rapidly, there remain many differences, anomalies and obstacles hampering to the development of a European training system that will ensure equal opportunities and common standards.

Management development is becoming more business-driven, action-led and practice-oriented. There is a clear drive towards "Europeanisation" and internationalisation. Management studies should be incorporated in the curricula for a wider range of professions. The formal learning system should be strengthened to cope with the increasing and changing demands placed on management training institutions all over Europe.

Approaches to learning are becoming more varied. The focus is switching from the classroom to business. New technologies are being harnessed to help the learning process. The traditional boundaries between formal education and practical training and development are becoming less distinct. Management development is seen as a key element in winning a competitive edge.

Europe needs competent and professional managers at every level. Training an elite is a necessary but not sufficient condition for business success. There is a particular need to ensure that the small and medium-sized companies, who supply the key components to large businesses and distribute their products, are professionally managed.

Because of lack of opportunity, time, and cost problems, many managers receive little or no training. As the quality of management becomes a key factor in development, substantial expansion of the existing system and the employment of new technologies will be needed.

The present poor feedback systems pose a danger that business schools will not find it easy to keep up with evolving company demands.

Courtesy of B.A.T

Particular concerns are:
- the ability of national schools to meet the need for the "Europeanisation" of management;
- the willingness to adapt to or develop new learning technologies, e.g. action-learning and the application of new technologies to learning;
- the supply of staff, their quality and ability to keep up-to-date;
- the flexibility to adapt to new patterns of learning, e.g. modular programmes and part-time courses.

A European model of management development is apparently emerging. It is rooted in the cultural diversity of Europe, which capitalises on the ability of European managers to move across frontiers, sensitive to a variety of cultural norms and able to recognise the opportunities offered by diversity.

It maintains a very pragmatic approach to learning opportunities. It uses the business itself as a source of learning, which helps to integrate theory and practice and enhances a genuine partnership between business schools and business itself.

Much of this development is still at an initial stage. Practice and standards vary from one country to another and between companies. Much remains to be done to raise standards of management in Europe as a whole to a level where business can regard itself as totally capable of global competition.

	IESE	IMEDE	IMI	INSEAD	ISA	LBS	MBS	RSM	SDA BOCCONI
Founded	1958	1957	1946	1959	1969	1966	1965	1970	1974
Status	University	Private	Private	Private	Chamber of Commerce	University	University	University	University
Number of participants per programme	200	65	16	400	199	230	105	100	120
% National participants	66	13	7	30	80	62	70	65	85
% Other European nationals	13	40	41	46	10	13	20	15	10
% Participants from the rest of the world	21	47	32	24	10	25	19	20	5
Average age of participants	25.5	30	30	28	27	27	26.5	26	27
Professional experience demanded before entry	No	Yes	Yes	Yes	No	Yes	No	Yes	No
Cost of programme (USD)	9,000	20,000	23,500 (Europe) 22,000 (non-E.)	16,500 (Europe) 21,275 (non-E.)	11,00	15,000	14,050	12,000	12,500
Length of programme (mo.)	21	11	10	10	16	21	21	18	16
Languages employed	Spanish Bi-ling.	English	English	English 80% French 20%	French 80% English 20%	English	English	English Dutch	Italian 95% English 5%
Average salary on leaving (USD)	36,000	72,000	74,000	60,000	50,000	50,000	35–90,000	25–30,000	–

IESE: Instituto de Estudios Superiores de la Empresa, Barcelona, Spain
IMEDE: Management Development Institute, Lausanne, Switzerland
IMI: International Management Institute, Geneva, Switzerland
ISA: Centre BEC-ISA, Chambre de Commerce de Paris, Jouy-en-Josas, France
LBS: London Business School, London, United Kingdom
MBS: Manchester Business School, Manchester, United Kingdom
RSM: Rotterdam School of Management, Erasmus University, Rotterdam, The Netherlands
SDA Bocconi: Scuola di Direzione Aziendale, Università Luigi Bocconi, Milano, Italy

Education and Training Activities of Some Companies

Most of the Round Table companies have a system of training and education to enhance in-house skill formation and thus competence.

All these systems and programmes have been adapted to specific demands and the local environment. Some companies with extensive and well-managed and organised training and education activities are described here.

In West Germany, Daimler-Benz AG and Siemens AG are presented, in Switzerland Holderbank and Nestlé, in the United Kingdom Pilkington, and in Scandinavia Nokia and Volvo. All these companies represent the latest developments in education and training and are breaking ground in the application and introduction of new models.

The German companies have adapted their models to the strong tradition of a publicly funded apprenticeship system. The Swiss companies are involving managers on a wide scale as teachers, and Pilkington is finding new ways to enhance the training of young school leavers. This company is also extensively involved on the British national scene in the promotion of new ideas in most fields related to VET.

The Nordic companies are in the process of developing close co-operation with public educational institutions on all levels. Volvo, for example, is engaged in giving basic primary education to some of its employees. Nokia is co-operating with the national educational system to give its employees the possibility to acquire various levels of degrees while at work.

Daimler-Benz AG is one of the major industrial concerns in West Germany and a significant manufacturer of automobiles. Its sales in 1987 amounted to 67 billion DM. The company employs more than 320,000 people globally.

Daimler-Benz gives 2 million hours of training, excluding management

Courtesy of Daimler-Benz

training, to its employees. In 1987 more than 82,000 of them took part in some form of training. The main emphasis was on high technology fields, with special attention to young people. The total amount spent on education and training amounted to 354 million DM, or 5.8% of personnel costs in 1987.

The company has three main forms of structured education and training: (1) continued education, (2) management education and training, and (3) non-structured continued education programmes. The latter category includes subjects like computer science, technology, languages, how to speak and learn, and introductory courses are included.

Management education and training is divided into three main parts: (1) general continued education, (2) continued education related to Daimler-Benz, and (3) international seminars and courses. General continued education includes subjects like the Daimler-Benz introductory seminar, strategic planning and decision-making, problem-solving, personal work planning, how to argue, discuss and convince. The Daimler-Benz-related continued education includes company policy, the company and society, and how to lead and develop business units. The international seminars and courses emphasise company policy and strategic planning.

The major role of unstructured programmes is unique for Daimler-Benz. In addition to job-related subjects in technology and business, there are not only language studies and leisure-related subjects, but also subjects like how to communicate at the workplace and within the family. Education is directly placed under a board member.

Funding is both centralised and decentralised. All education is co-ordinated centrally. The central organisation has its own budget but each business unit is required to invest a certain amount annually in training and education.

Siemens AG, with sales in 1986 exceeding 47 billion DM and more than 360,000 employees, is one of the largest and most significant companies in West Germany.

The use of new technologies in manufacturing and in the office has had an effect on the structure of the work and on the qualifications required of employees. The number of engineering assignments continues to rise, while the proportion of manufacturing jobs, particularly for unskilled workers, is becoming smaller. There is every indication that shifts in the workforce structure will continue. Siemens AG employs about 192,000 people in West Germany. 40,300 of them (21%) are graduates of universities and Fachhochschulen.

Training and continuing education is a primary concern of Siemens personnel policy. Expenditure for this purpose, like capital investments and R&D expenses, has been raised over the past few years. In 1987 it totalled approximately 840 million DM, which represents 6.3% of total wages and salaries.

The amount spent by Siemens AG on vocational training in 1987 came to 310 million DM. The expense related to continued education amounted to 530 million DM.

The training and development programmes include vocational training and retraining schemes for employees, internships, specialised and general continuing education sessions, and advanced training courses for teaching staff and management personnel. Siemens itself trains a major portion of its skilled workers, commercial staff, and technical assistants. At present there are some 15,000 trainees on the workforce, about 400 of them young people from abroad.

Siemens offers training in 60 different manufacturing, commercial, and technical occupations. The emphasis is on training in manufacturing skills, in accordance with the German Dual System. About two-thirds of the 10,940 manufacturing apprentices are being prepared for a career in electrical engineering or electronics, and about one-third are learning a metal-working trade. The ratio of trainees in the total skilled workforce (45,300) is 24%. Manufacturing training at Siemens involves instruction in more than 50 industrial occupations and at some 70 trainee workshops and training centres.

Some 1,000 instructors trained in pedagogical methods are working in this sector. An even greater number of part-time training staff give young people initial guidance during their formal traineeships in workshops, offices, and on installation or construction sites.

Among the trainees are 2,000 young women; 600 of them are being prepared for jobs in manufacturing, 500 for technical occupations, and 900 for commercial positions.

On completion of their intermediate examinations, gifted university students, particularly those studying technical or scientific subjects, may join the "Siemens Student Circle for Engineers", giving them access to seminars, scholarships, internships, and specialist literature. For students of economics and business administration who have performed well in their intermediate examinations, the Siemens "Corporate Curriculum Programme" provides systematic courses of preparatory and complementary study.

The Siemens comprehensive continuing education scheme is open to all employees. The special courses and seminars offered deal with product- and function-

oriented as well as interdisciplinary subjects. In addition, a large number of management development courses are held. These in-house programmes are complemented by continuing education on the job and participation in events, courses and programmes arranged by external institutions, such as technical academies, universities, engineering societies and others.

Each year, about 180,000 employees participate in a total of about 15,000 continuing education sessions and events in West Germany. This is equivalent to approximately 5 million course attendance hours per year. Two-thirds of the continuing education programmes deal with new in-house products and processes. Approximately 25% of the continuing education programmes are revised every year on the basis of new developments and information.

Systematic continuing education seminars and courses are held at product-oriented schools. Basic interdisciplinary subjects of a technical and business nature, foreign languages, organisation and methods, and management development are dealt with at training centre sessions. The regional offices and plants are responsible for seminars relevant to special regions. There are special continuing education programmes for executive personnel and teaching staff. If required, in-house programmes are developed and run in close co-operation with specialised institutes, universities and Fachhochschulen.

At the training centres, regional offices, and plants, Siemens provides an increasing number of self-tutoring stations, which employees can use to continue their education individually. In addition, a number of correspondence courses, consisting of both lessons and training phases, are offered. This is especially important for locations without a training centre.

Continuing education courses are organised with a staff of 700 teaching professionals and 3,000 part-time instructors. One advantage of having part-time instructors who are still active in industry, particularly if they are senior executives, is that new methods and developments can be immediately put into practice.

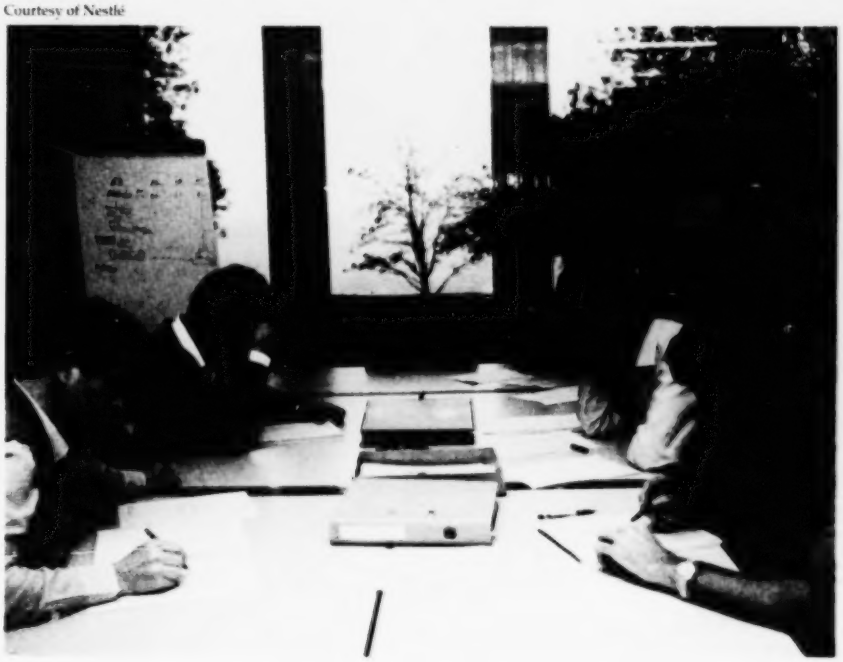
Special emphasis is placed on "training the trainers". Instructors in the manufacturing and technical areas, for example, participate in a four-week programme of seminars culminating in a teaching aptitude examination. Numerous advanced seminars are also offered to enhance and expand the teaching proficiency and knowledge of the training staff.

Nestlé of Switzerland, with sales in 1987 exceeding 35 billion CHF and 163,000 employees is an industrial group consisting of 200 operating units of different sizes that share a common culture. This structure is compatible with the diversified nature of their activities and enables the individual companies to maintain their intimacy and distinctive characteristics as the group grows larger.

The operating companies enjoy a great deal of independence within the guidelines of long-term policies established for the Group and adapted to local conditions. It operates some 360 factories on five continents, half of these factories have fewer than 200 employees. Nestlé as a multinational group is mainly concerned with food and body care products which it produces in over fifty countries.

Nestlé is organised in a highly decentralised way and management emphasises products and

Courtesy of Nestlé



people more than the strict application of abstract systems. An important factor in human development is training, which is mainly decentralised. Operating units are required to offer training opportunities to their managers, employees and workers. However, the company places special emphasis on the development of managers and specialists and offers at its International Training Centre in Switzerland a large variety of seminars and workshops. Nestlé has worldwide about 10,000 managers and highly specialised staff to be trained, the philosophy being to "train and motivate Nestlé employees worldwide to make positive contributions to the attainment of the Group's objectives and to improve its long-term competitive position". On the other hand, the company acknowledges that each individual is responsible for his or her personal development, which cannot be substituted for by the company. An important aspect is the on-the-job training, which cannot be replaced by formal training, but the latter is an appreciated complement. The three main objectives of training are (1) to maintain and improve knowledge and work skills, (2) to accelerate the development of those with potential for advancement, and (3) to assist those who move to new assignments which require training.

Apart from these basic objectives, training activities should help to foster corporate culture and a sense of Group identity, for which the Training Centre is an ideal place, seeing that 75% of the teaching is done by Nestlé managers, specialists and trainers. Another important aspect is the exchange of experience, with participants from all over the world.

A special group is prepared for an international career. An initial on-the-job training mixed with classroom seminars is offered during a period of 1½–2½ years. For this group it is especially essential to look after the company's interests as though they were one's own, through (1) mobility or the willingness and ability to move about both physically (i.e. from one geographical area to another) and socially, (2) adaptability both in geographical and intellectual terms, and (3) linguistic skill. The minimum requirement is for two languages, the preference being for English, French and Spanish.

Attitudes that are sought include a critical and positive mind, a certain readiness to learn new basic skills, acceptance of the hierarchic system and the Nestlé system for appraisals and to be action-oriented and get things done.

Fiat SpA is one of the larger private industrial groups in Italy with activities in many sectors. The company employs over 270,000 people. The most important education and training services are provided by Isvor Fiat SpA – a Group company that specialises in industrial training and management education.

Fiat's objective in establishing this company was to promote and pursue wide professional development of all Group personnel, ensuring a high standard of educational services provided by an independent company.

Isvor's main goal is to supply the educational needs of all the Fiat Group's companies, both organisationally and technologically. Isvor also sells up to 15% of its training programmes to non-Fiat companies. Isvor was established in 1978 after a merger between three earlier Fiat training structures: The School of Apprentices (founded in 1922), the Centre for Foremen and the Industrial Development and Training Institute.

To face the challenges of organisational complexity within companies and ever-changing technological innovation, Isvor maintains a structure suitable to specific and different training needs and consistent with a reliable principle of continuous training. It also offers tailor-made consultancy services.

Isvor's Technological Training Department is one of the most updated and efficient organisations working in the field of technical and technological training in Europe today. It operates in a specially equipped area where all situations that an engineer could come across in a real factory are re-created. Technical training is carried out here for a wide range of trainees: from newly-hired workers to professional managers.

The Institute for the Application of Industrial Techniques with its "accelerated experience simulations" programmes is specifically oriented towards newly-hired personnel and has three basic targets:

- job-specific basic training,
- "common job language" training (management information systems, expenditure awareness, etc.),
- training to understand the "enterprise system" and its organisational and operating logic.

The Management Training Department's task is to develop tailor-made programmes on industrial topics such as total quality programmes, automation systems, materials management and cost accounting.

The Management Centre offers institutional courses for managers, examining internationalisation of the Fiat Group and developing managerial professionalism. Isvor provides high standards directed at top executives who face the Group's different and complex problems.

A specific project called "Top Management Programme" is for Group managers studying updating programmes on strategic issues. The teaching staff works in co-operation

with international consultants.

The "Advanced Educational Technology Project" is involved in studying, developing and applying new technologies and methodologies in the field of training and education.

Pilkington plc with head offices in the United Kingdom is one of the world's leading manufacturers of glass and glass-related products. It is also a world leader in vision care products, electro-optical systems, and glass and mineral wool. It employs nearly 58,000 people.

The company is divided into several operating divisions and functions. Included in Group Personnel Services is the Group Training and Development Department which has the following roles:

- to advise the Board on human resource development (H.R.D.) strategies, methods and technologies;
- to keep abreast of advances in H.R.D.;
- to provide an internal consultancy on H.R.D. education and training to companies in the group;
- to manage the central training units providing a range of training events for operating units.

It is estimated that in Europe the Group spends about £5 million annually on training and education. This figure excludes the salaries and wages of trainees during training.

Every division and operating unit is responsible for education, training and development of its human resources. The line management is responsible for effecting this policy, with the Personnel Director of each division having a supervisory function. Divisions are free to use whatever resources are available locally, in-company or external, in order to implement their education and training policies. They call on the Group Training and Development Department to help them as and when required.

Sixteen-year-old school leavers are recruited into the three training schemes, initially for a two-year programme run as part of the national Youth Training Scheme. These include engineering, production and administration.

In addition to the 16-year-old intake in the administration area, a small number of trainees with a higher level of qualifications are taken on at 18. These trainees undergo an accelerated training programme, achieving in 1 year what the 16-year-olds cover in 2 years.

Programmes of adult training are provided to meet business needs and/or individual qualification requirements. A series of courses is also run for supervisors at all stages of development, in addition to a range of demand-based courses in marketing and selling.

Newly-recruited graduates attend a series of courses aimed at integrating them quickly into the company. All new graduates are expected, during their first two years, to study part-time for qualifications including: Diploma in Management Studies, Institute of Marketing, Institute of Purchasing and Buying, and Institute of Personnel. In addition, they would attend courses in their specialist subjects at universities and other training organisations.

All managers should expect to attend an executive development course at the start of their managerial careers. Those managers with potential are nominated in succession plans, and individual career plans are fed into annual training plans.

After the initial management development course, managers will proceed to the next internal programme, which concentrates on business development, the individuals development following that of the business.

All managers who are appointed directors of companies attend a programme at the Institute of Directors dealing with their legal responsibilities. Directors who have been in their post for some time, may attend an in-house Director Development Programme.

Schools, colleges and universities are used where their products are relevant to Pilkington's business needs. In the UK there are many institutions which are the guardians of professional standards, conduct and ethics. These have the right to ensure that as many employees as possible have learned and understand the theory and have the practical skills they need. Competence implies possession of both.

Nokia is a Nordic-based international electronics company with net sales of US$ 5.5 billion and approximately 44,000 employees.

The principles of technology training

Nokia is investing in expertise. The extremely rapid development in all fields of technology makes it necessary to update knowledge and skills continuously as well as to acquire new expertise. Nokia's competitiveness depends on the competence of its employees.

Continuous maintenance of expertise demands constant motivation. The desire alone to learn is not always enough; a more concrete goal is also needed. Nokia offers its employees the opportunity to develop and educate themselves while working and obtain a generally accepted degree.

Nokia's training activities are based on co-operation with universities

and numerous other educational institutes. They offer a formal training setting, professional teachers and performance evaluation.

To achieve this goal, Nokia has implemented a number of technology training programmes: Ph.D., M.Sc. Eng., B.Sc. Eng. and continuous training and vocational education for workers.

The technology training programmes were launched with the post-graduate courses in Finland in January 1987. By the end of the year the programmes were expanded to the level of M.Sc. Eng. During 1988 continuous training programmes on the B.Sc. Eng., technician and employee level commenced. Corresponding training programmes will start in the near future in other countries, too. This depends, however, on the opportunities, training needs, and willingness of each division.

Courtesy of Nokia

Student selection

Each Nokia employee applies for the training programme needed. The employer selects the participants for the courses in relation to the themes with which they are currently working or will be in the near future. The university or institute approves the students to be enrolled and sets the level that studies have to meet. The university is responsible for the standard of instruction, and evaluates study performances, too.

Content of the programmes

The post-graduate courses are integrated with Nokia's own research projects and the training needs are determined by the various divisions of the Nokia Group. The division in question and the Nokia Training Centre are responsible for organising the training programme with the appropriate educational institute. The Training Centre and the institute organise the courses, engage the required Finnish or foreign lecturers and are responsible for the content of each course.

New curricula

In addition to the normal curricula of universities and other institutes, new curricula are often needed. These are developed partly in co-operation with other Nordic and European companies in fields of, for example, software engineering, microelectronics and technology management.

Ph.D. programme

Each post-graduate course lasts 4–5 months. Lectures and seminars are held once a week. The courses also include an intensive period lasting several days, during which top international experts are invited as lecturers. Post-graduate study requirements are set by the university and professor.

Post-graduate students enrol at the university of their choice and apply for approval of their personal study plans. The appropriate professor is selected and is responsible for the level of the course, its structure and content. Together with the Nokia Training Centre, the professor shares responsibility for the approval of the course in the universities. The professor directing the course is free to use university instructors or experts from industry as lecturers. The students themselves participate in giving lectures at seminars. A degree can be gained in three years.

B.Sc. Eng. programme

The B.Sc. Eng. programme is conducted together with the vocational schools and colleges. The courses consist of lectures, exercises and laboratory work, which are partly compensated by work pertaining to the assignments. Performance is evaluated by examinations. Studies follow a

modular system according to subjects. The student's own field is reflected in the professional subjects so that the courses support the student's everyday work as well as the development of his career.

Students are selected by Nokia and by the technical college. The institute arranges the subjects and sets the proper levels that the studies will have to meet. Courses take place on Nokia's premises. The instructors are from the institute and experts from industry, particularly from Nokia.

Personnel training programme

The first personnel training programme began at the Salcomp factory in Kemijärvi. Interest was very high and almost all of the staff enrolled. The shopfloor employees and technicians were the most enthusiastic. The training programme dealt with the different sectors of component technology and quality. The courses also gave an overall view of the TV business. The result was a significant interest in a wider aspect of work, improved quality and interest in studying for a degree.

Expenses

The Nokia Training Centre is responsible for agreements made with the institutes and professors and other teachers. This covers related expenses, rentals on facilities and other fixed expenses. Each division is responsible for travel expenses and material expenses incurred by its own participants in the courses, as well as the loss of working time. The students themselves contribute their time and interest.

Experiences

Students are still very positive and enthusiastic about the programmes. The proportion of drop-outs has been less than ten per cent in all the programmes combined. Studying while working has, however, proved to be demanding – especially at M.Sc. Eng. and B.Sc. Eng. levels. The post-graduate courses are easier to tailor to actual needs and the students can select each course independently.

For the most part, higher educational institutes have had a positive attitude. The biggest problem has perhaps been the teaching resources.

The training programmes, which are implemented in co-operation with universities and other educational institutes, have been successful. The programmes are more motivating than normal short courses and the discussions and meetings have promoted additional kinds of R&D activities with universities.

Courtesy of Volvo

Consequences of Structural Change in Industry and Education

The nature of doing business is rapidly changing. In some industries production facilities are renewed together with product changes; only the company's personnel remains the same. Therefore, productive functions (machinery and buildings) are to an increasing extent treated as costs while human resources, due to legal restraints, have become ipso facto a permanent investment. Companies need the strategic capability which comes from people through their solid and substantial learning experience.

In many European companies, very important – and sometimes revolutionary – changes in organisational structure are taking place. Thus companies would be well advised to pursue both long-term education and training policies, in order to develop a workforce with strategic capability, and short-term policies to achieve the necessary general flexibility in their market responsiveness.

Therefore, the nature of organisational function and funding should be re-evaluated. The education and training function should be part of the company's strategic planning and organised as part of it. As the business changes rapidly the company must prepare staff for the new challenges.

At one phase in the development of management training, it was felt that the production of excellent individuals would lead to an "excellent" company. This was never true because all organisations need co-ordinated effort. The move from a functional to a system organisation means that the co-ordination of the work of project groups to produce new products, customer care teams to service customers, total quality programmes to raise standards throughout the organisation and co-operation with suppliers, all presuppose a high degree of team work.

The trends identified above have produced the need for corporate cultures which are results-centred, adaptive, able to communicate and demand high standards. This type of culture is becoming increasingly common in ERT-related companies and in some cases represents a considerable change from the culture which preceded it. To achieve the change demanded a through review of managerial practices, systems, leadership styles, value systems and philosophies.

The style and culture of various types of organisation reflects on management development practices. Three approaches to management development can be distinguished, the fragmented, the formal and the focussed.

A fourth model is here presented – the supportive – in which the individual determines and satisfies his own development needs with the support of the organisation.

The great majority of Round Table companies fall into the formal category but with a distinct trend towards focussed and supportive approaches. Very few companies can be described as fragmented. The real differences between formal and focussed companies lie not so much in their analysis of the skills required, but in what they do about it. The formal company tends to instil these skills in managers through structured programmes.

The focussed companies, whilst acknowledging the importance of the skills, take a production output approach. They begin by analysing the business results expected of a manager, identify the behaviour required to achieve these results and attempt to identify the key competences required for success.

For example, the competences required by a senior manager in a rapidly growing organisation are different from those required from one which is in slow decline. The problems of managing an acquired business contrast vividly with those involved in managing a unit within a well established stable business. To treat all these managers as a group of senior managers for development purposes and to send them to the same or similar programmes misses the point. The focussed company tries to undertake a much more detailed analysis and develop training solutions which were specific to the person.

There are important differences both in philosophies and practices between formal and focussed companies. The key differences are in career and management development and in the development of managers.

In career development formal companies see change as evolutionary. They believe in a planned future, and careers are no exception. Lifelong employment is still a possibility in some ERT companies. These companies like to recruit young people and develop them over a total career in the company by providing them with promotion and development opportunities.

Focussed companies have concluded for a number of reasons that lifelong careers are no longer so easy to guarantee. Mergers and acquisitions, changes of strategies, and entry to new markets mean that planned development is difficult. Furthermore, this type of company argues, fresh blood is useful.

Focussed companies therefore rely less on formal appraisal systems and more on spotting high performance managers from the results they have achieved. The successful ones are then given more and more opportunities. Career development takes place through testing rather than planning.

The final responsibility for the development of personnel competence lies with employees and individuals. This presupposes willingness to take the necessary steps, with the company's role that of providing the opportunities. Nobody is forced to undergo training, but not doing so might have serious implications on one's career.

Education and training is increasingly treated as a strategic investment, with the head office ensuring that a certain level is reached annually. Similarly, education and training is a strategic investment vital to the company's future success and not a cost for running a day-to-day operation. Business and product-related training is being brought closer to an operational business unit. The manager responsible for a business unit is responsible for updating the knowledge level of his or her unit.

Bibliography

Beare, H., and Lemke, H., (1987), "The Curriculum and the Economy", Restricted, OECD, Paris

Braddick W.A.J. and McAllister D., (1988) "Management Development Practices in the ERT Group of Companies – A Report and Recommendations", (Internal Memorandum), European Foundation for Management Development, Brussels

Cavallé, C., (1987), "Managing Successfully in a Multicultural Environment. What Does it Mean to Management Development?", European Foundation for Management Development, Brussels

Cerych, L., and Jallade, J.-P., (1984), "Competences and Competition, Training and Education in the Federal Republic of Germany, the United States and Japan", National Economic Development Office and Manpower Services Commission, London

Cerych, L., and Jallade, J.-P., (1986), "The Coming Technological Revolution in Education", A Report to the Dutch Ministry of Education and Science, European Institute of Education and Social Policy, Paris

Cerych, L., and Jallade, J.-P., (1988), "Interactive Video Disks (IVD) in Education, an Assessment Based on Experiments in the U.S. and the U.K.", A report to the Dutch Ministry of Education and Science, European Institute of Education and Social, Paris

"Compulsory Schooling in a Changing World", (1983), OECD, Paris

Constable, J., and McCormick, R., (1987), "The Making of British Managers: A Report for the BIM and CBI into Management Training, Education and Development", British Institute of Management, Northants, United Kingdom

Continuing Education of Engineers – Investment into the Future, Proceedings of the 1st European Forum for Continuing Engineering Education, 30th Nov – 2nd Dec 1988, Stuttgart, Technische Akademie Esslingen, Ostfildern, 1988

"Demographic Statistics" (1987), Theme 3, Series C, Eurostat, Luxembourg

Easterby-Smith, M., and Tanton, M., (1988), "Strategies and Faculty Development in Business Schools and Management Development Institutions: An International Study", University of Lancaster, United Kingdom

"Effective Engineering Education", (1988), Conference Report, Helsinki University of Technology and Engineering Society, Finland (STS), Melburyhill, SEFI, Helsinki

Eurich, N.P., Hasegawa H., and Sadler Ph., (1986), "Recent Trends in Management Development", European Foundation for Management Development, Brussels

"A European Policy for Europe", (1982), Office for Official Publication of the European Communities, Luxembourg

European Society for Engineering Education, (1986), Joint Europe/North America Continuing Education Forum, Palo Alto (California). Report, SEFI, Brussels

Fonda, N., and Hayes, F.C., (1988), "Education, Training and Economic Performance: Positioning for Turbulent Times", Oxford Review of Economic Policy, Volume IV, Oxford

Grootings, Peter, et al, (1988), "Work and Learning", Presses Interuniversitaires Européennes, Maastricht

Handy, C., (1987), "The Making of Managers: A Report on Management Education, Training and Development in the USA, West Germany, France, Japan and the U.K.", Manpower Services Commission, National Economic Development Office, London, U.K.

Hessler, A., (1988), "Efforts to Change Higher Education Systems in the F.R. Germany and Great Britain", (Internal Memorandum), Fundesco, Spain

"Intergovernmental Conference on Education and Economy in a Changing Society", (1987), Issue Papers, OECD, Paris

Jallade, J.-P., (1982), "Alternance Training for Young People: Guidelines for Action", CEDEFOP, Berlin and CEE, Luxembourg

Jallade J.-P., (1988), "La formation professionnelle à l'étranger. Quels enseignements pour la France?", Commissariat Général du Plan, La Documentation Française, Paris

Kairamo, Kari, (ed), (1989), "Education for Life: A European Strategy", Butterworth Scientific Limited, Surrey, U.K.

Le Monde, (1988), September 15, 1988, Paris

Lesourne, J., (1988), Education et Société, les défis de l'an 2000", La Découverte, Paris

"Livre Bleu pour une Europe de l'Education et de la Culture", (1987), Ministère de la Culture et de la Communication, Ministère des Affaires Etrangères, Ministère de l'Education Nationale, Ministère Délégué Chargé des Affaires Européennes par la République Française, Paris

Lyman, W., and McKibbin L.E., (1988), "Management Education and Development", McGraw Hill, New York

"Making Europe Work", (1986), A report for the Round Table of European Industrialists, Jernström Offset, Sweden

"Management for the Future", (1988), Ashridge Management College and Foundation for Management Education, Ashridge, United Kingdom

"Meeting of Management Experts on Training of the Adult Labour Force in a Constantly Changing Labour Market", (1988) OECD, Paris

Murrey, D.J. and van Seventer, C.W., (eds), (1988), "Report on Course and Credit Transfer", The European Association of Distance Teaching Universities, Projecto Universidade Aberta, Lisboa, Portugal

"New Technologies in the 1990's: A Socio-Economic Strategy", (1988), OECD, Paris

"Oxford Review on Economic Policy", (1988), Oxford University Press, Oxford

Platt, R.R., (1988), "A View of Interactions between Government, Industry and Higher Education in the United Kingdom", Salford University, United Kingdom

"Policies of Transition, EC Report on the Action Programme, Transition of Young People from Education to Adult and Working Life", (1984), IFAPLAN, Brussels

Ros F., (1986), Formacion de técnicos investigadores en tecnologias de la informacion", Fundesco, Madrid

Ros, F., (1987), "Some Comparative Data on Higher Education Systems in Western Europe, North America and Japan", (Internal Memorandum), Fundesco, Spain

Squires, G., (1987), "Organisation and Content of Studies at the Post-Secondary Level", OECD, Paris

Stoob, F., and Troll, L., (1988), "Das Arbeitsmittelkonzept als Instrumentarium zur Beobachtung des Technologischen Wandels", Institut für Arbeitsmarkt und Berufsförderung Bundesanstalt für Arbeit, Nürnberg

"Structural Adjustment and Economic Performance" (1987), OECD, Paris

"Sweden's Vocational Education in Transition", (1986), Swedish Ministry of Education and Cultural Affairs, Stockholm

Trindade, A.R., (ed), (1988), "Report on Long-Term Developments for European Distance Education", The European Association of Distance Teaching Universities, Projecto Universidade Aberta, Lisboa, Portugal

UNESCO Statistical Yearbook, (1986), UNESCO, Paris

Terminology

Action learning
A means of intellectual, emotional and physical development through involvement in the solution of real, complex and stressful problems, i.e. learning by doing.

Basic education
Education necessary to function in society. The compulsory schooling up to 16 years of age and education for the 16–18 age group, whether it is carried out in schools, apprenticeships or in work-based training schemes.

Centre of excellence
A higher education centre, such as a university, specialising in one or more selected areas of research or academic study.

Certified vocational qualifications
Qualifications generally recognised by European employers.

CAI
Computer-assisted instruction.

COMETT
Community Action Programme in Education and Training for Technology (EC programme).

Compatibility
Consistency between the levels and contents of vocational or academic degrees awarded in various European countries.

Competence
The ability to apply knowledge, skills and experience in the solution of problems on a day to day basis.

Core curriculum
Curriculum leading to a minimum competence for everybody, to which options may be added to suit a person's tastes and activities. Core curriculum elements are present in the curricula of specific subjects.

Courses
Usually short-term, condensed and limited education programmes with the purpose of giving knowledge in a specific field or subject.

CRE
Standing Conference of Rectors, Presidents, and Vice-Chancellors of the European Universities, Geneva.

Curriculum
What is taught and learnt in schools and other educational institutions.

DELTA
Developing European Learning through Technological Advance (EC programme).

Distance learning (education)
Open learning referring specifically to learning at a distance from the tutor. Teaching and learning through TV, video programmes, radio or mail.

Dual system of vocational training
A combination of training programmes in companies and school-based instruction in vocational schools with an average duration of 3 years. Trainees in West Germany, for example, undergo vocational training for 4 days a week in the company and one day at the vocational school. The dual system is used mainly in West Germany, Austria and Switzerland.

Education
Proficiency in understanding and knowledge within a particular category of skill. An example would be high school, college or university.

Electronic teaching aids
TV, video, PC's, language laboratories; otherwise known as Computer Aided Learning (CAL) or Interactive Video Disc Learning (IVDL).

ERASMUS
European Community Action Scheme for the Mobility of University Students (EC programme).

ERT
European Round Table of Industrialists, Brussels.

European awareness
A comprehension of and sense of affinity with the cultural and economic values of Europe.

Euro-PACE
European Programme for Advanced Continuing Education. Euro-PACE is an industry-sponsored and financed distance learning programme based in Paris.

European Economic Space
EC and EFTA countries.

Fundamental basic skills
Reading, writing, natural sciences (mathematics, physics, chemistry) and a provision for oral communication in the mother tongue, in English and one other major European language.

Graduate
A person who has completed studies in an educational institution (college or university) and has been awarded a degree.

Higher education
Training institutions beyond matriculation, i.e. after finishing secondary level II, like colleges, universities and business schools.

Industrial tutors
Qualified individuals from industry to help students get the best out of their periods in a company.

Industry inspectors
Body of individuals from industry responsible for examining current school-based practices in the teaching of a specific set of skills.

In-plant training
Vocational training in a firm as part of an apprenticeship or within the dual system.

Intermediate university degree
University degrees below MA level, e.g. BA.

Log book
Records of a person's personal achievements, illustrating a student's progress in each learning area.

Managerial skills
Skills related to effective organisation of work and people, and leadership. The planning of human and other resources in an effective way.

Modules
Self-contained parts of a curriculum.

NORIT
Nordiskt Institut för Informationsteknik (Nordic programme sponsored and financed by Nordic industries).

Off-the-job training
Job-related training activities taking place outside normal working hours.

On-the-job training
Job-related training activities, either as part of a job or closely related to it, taking place during normal working hours.

Open learning
Any form of teaching, other than by formal course, which enables an individual or individuals to learn at their own pace, at the most convenient time, in optional locations, with minimum support.

Open university
(See open learning.) In the United Kingdom, not only is there the Open University, there is also the Open Tech for technician training and, more recently, the Open College for people to study at below-degree levels. All of these constitute distance learning approaches with open access to courses.

Partnership
Training arrangements between schools, universities and other training institutions and individuals.

Post-graduate university degree
Dr., Ph.D. and Licentiate (Denmark, Finland and Sweden).

Retraining
Education and training for new skills or updating and upgrading knowledge and skills.

Skill
The ability to carry out a task.

Study programme
A limited field of study, often consisting of several courses or modules.

Tailor-made studies
Studies developed in order to master a specific subject or technology.

TARGET
Joint educational institution and industry project, Thames Valley, UK, financed within the EC COMETT programme.

Targetted studies
Limited studies in a specific field with the purpose of giving comprehension and mastery of that field.

Training
Providing the understanding and knowledge along with the skill or ability to do the job. A good example would be on-the-job training combining classroom and "hands on" lessons.

Transferability
Recognition of vocational or academic degrees in European countries other than those in which they are awarded.

Trilingualism
Mastering one's mother tongue, English and one other major European language.

VET
Vocational education and training.

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